

22101957209

B.R. 518A (RESTRICTED)
GEOGRAPHICAL HANDBOOK SERIES
FOR OFFICIAL USE ONLY

NETHERLANDS EAST INDIES

VOLUME II

November 1944

NAVAL INTELLIGENCE DIVISION

*This book is for the use of persons in H.M.
Service only and must not be shown, or
made available, to the Press or to any
member of the public.*

TRO

RAWIC

GII.

/GRE

P R E F A C E

IN 1915 a Geographical Section was formed in the Naval Intelligence Division of the Admiralty to write Geographical Handbooks on various parts of the world. The purpose of these handbooks was to supply, by scientific research and skilled arrangement, material for the discussion of naval, military, and political problems, as distinct from the examination of the problems themselves. Many distinguished collaborators assisted in their production, and by the end of 1918 upwards of fifty volumes had been produced in Handbook and Manual form, as well as numerous short-term geographical reports. The demand for these books increased rapidly with each new issue, and they acquired a high reputation for accuracy and impartiality. They are now to be found in Service Establishments and Embassies throughout the world, and in the early years after the last war were much used by the League of Nations.

The old Handbooks have been extensively used in the present war, and experience has disclosed both their value and their limitations. On the one hand they have proved, beyond all question, how greatly the work of the fighting services and of Government Departments is facilitated if countries of strategic or political importance are covered by handbooks which deal, in a convenient and easily digested form, with their geography, ethnology, administration, and resources. On the other hand, it has become apparent that something more is needed to meet present-day requirements. The old series does not cover many of the countries closely affected by the present war (e.g. Germany, France, Poland, Spain, Portugal, to name only a few); its books are somewhat uneven in quality, and they are inadequately equipped with maps, diagrams, and photographic illustrations.

The present series of Handbooks, while owing its inspiration largely to the former series, is in no sense an attempt to revise or re-edit that series. It is an entirely new set of books, produced in the Naval Intelligence Division by trained geographers drawn largely from the Universities, and working at sub-centres established at Oxford and Cambridge. The books follow, in general, a uniform scheme, though minor modifications will be found in particular cases; and they are illustrated by numerous maps and photographs.

The purpose of the books is primarily naval. They are designed first to provide, for the use of Commanding Officers, information in a

comprehensive and convenient form about countries which they may be called upon to visit, not only in war but in peace-time; secondly, to maintain the high standard of education in the Navy and, by supplying officers with material for lectures to naval personnel ashore and afloat, to ensure for all ranks that visits to a new country shall be both interesting and profitable.

Their contents are, however, by no means confined to matters of purely naval interest. For many purposes (e.g. history, administration, resources, communications, etc.) countries must necessarily be treated as a whole, and no attempt is made to limit their treatment exclusively to coastal zones. It is hoped therefore that the Army, the Royal Air Force and other Government Departments (many of whom have given great assistance in the production of the series) will find these Handbooks even more valuable than their predecessors proved to be both during and after the last war.

J. H. GODFREY,
Director of Naval Intelligence
1942

The foregoing preface has appeared from the beginning of this series of Geographical Handbooks. It describes so effectively their origin and purpose that I have decided to retain it in its original form.

This volume has been prepared for the Naval Intelligence Division at the Cambridge sub-centre (General Editor, Dr. H. C. Darby). It has been largely written by Mr. J. S. Furnivall with contributions from Mr. S. H. Beaver, Dr. P. W. Richards, Mr. J. C. Stuttard, and Mr. T. G. Tutin. The maps and diagrams have been drawn by Mr. A. O. Cole, Miss H. Collins, Miss K. S. A. Froggatt, Miss F. Hands and Miss J. D. I. Tyson. The volume has been edited by Mr. J. C. Stuttard and Mr. T. G. Tutin.

E. G. N. RUSHBROOKE,
Director of Naval Intelligence

November 1944

CONTENTS

PREFACE	PAGE iii
LIST OF MAPS AND DIAGRAMS	ix
LIST OF PLATES	xii
 I. THE PEOPLE	 I
Introduction: Physical Types: Languages: Peoples of Java: Peoples of Sumatra: Peoples of Borneo: Peoples of Celebes: Peoples of the Moluccas: Peoples of New Guinea: Peoples of Bali and Lombok: Peoples of the Timor Group: Education: Bibliographical Note	
 II. HISTORICAL OUTLINE BEFORE 1800	 38
Introduction: Indian influence from the second century to the eighth century A.D.: The Sailendra Dynasty, A.D. 750-850: The Kingdom of Mataram, A.D. 850-1007: The Kediri, Janggala and Singhasari Kingdoms and the Decline of Sri-vijaya, 1007-1292: The Kingdom of Majapahit, 1292-1500: The Expansion of Islam, 1292-1500: The Portuguese in the East Indies, 1500-1600: European Commercial Rivalry in the East Indies, 1600-84: The Rise of Dutch Power in Java, 1600-84: The Consolidation of Dutch Power in Java, 1684-1780: The Growth of Dutch Rule in the Outer Provinces, 1600-1800: Administrative Organization under the Dutch East India Company: Dissolution of the Dutch East India Company, 1798: Bibliographical Note	
 III. HISTORICAL OUTLINE, 1800-1939	 70
Introduction: Colonial Policy of the Batavian Republic, 1795-1806: Administration of the East Indies under Daendels, 1806-10: British Rule under Raffles, 1811-16: Restoration of Dutch Rule in Java, 1816-24: Dutch Rule in the Outer Provinces, 1816-24: The Anglo-Dutch Treaty of 1824: The Java War, 1825-30: Java in the period 1830-70: The Outer Provinces in the period 1830-70: The East Indies under the Liberal System, 1870-1900: The Subjugation of Atjeh, 1873-1900: Political Events in the Outer Provinces, 1900-10: Growth of Nationalism, 1900-14: Administrative Changes, 1900-39: Growth of Political Parties and of Nationalist Movements, 1914-39: Relations with Japan, 1918-39: Bibliographical Note	
 IV. GOVERNMENT, ADMINISTRATION AND LAW	 104
Introduction: Constitution: Influence of the Netherlands Government in East Indian Affairs: Central Government: Local Government: Legal System: Police System: Bibliographical Note	

V. GROWTH AND DISTRIBUTION OF POPULATION	130
General Features: Distribution of Population: Growth of Population: Immigration, Emigration and Colonization: Rural Settlement: Towns and Cities: The European Population: The Chinese Population: The Arab Population: Bibliographical Note	
VI. AGRICULTURE	169
General Features: Irrigation: Chief Crops: Livestock: Horticulture: Distribution of Crops and Livestock: Agricultural Policy: Land Tenure: Fisheries: Bibliographical Note	
VII. FORESTRY	233
Extent and Character of the Forests: Economic Value of the Forests: Forest Policy and Administration: Bibliographical Note	
VIII. MINING	247
Mineral Resources: The Administration of Mining: Petroleum: Tin: Other Minerals: Bibliographical Note	
IX. INDUSTRY	271
Native Industries: European Industries: Power: Bibliographical Note	
X. LABOUR	284
Introduction: Labour in Java: Labour in the Outer Provinces: Trade Unionism: Bibliographical Note	
XI. COMMERCE	296
Introduction: Exports: Imports: Direction of Foreign Trade: Trade and the Economic Crisis, 1930-37: Regulation of Exports: Regulation of Imports: Regulation of Foreign Trade by Reciprocal Agreements: Bibliographical Note	
XII. FINANCE	324
Monetary System: The Budget: Incidence of Taxation: Banking and Credit: Capital Investments: Bibliographical Note	
XIII. PORTS	339
Introduction: Ports of Java—Batavia (Tandjoengpriok); Cheribon; Tegal; Pekalongan; Semarang; Soerabaja; Pasoeroean; Probolinggo; Panaroekan; Kalianget; Banjoewangi; Tjilatjap; Ports of Sumatra—Sabang; Oeleëlheuë; Pangkalanbrandan (Pangkalansoesoe); Belawan; Tandjoengbalai; Laboehanbilik; Rengat; Djambi; Palembang; Belinjoe; Soengailiat; Tandjoengpandan; Teloekbetoeng (Oosthaven); Padang (Emmahaven); Sibolga; Ports of Borneo—	

Pontianak; Bandjermasin; Balikpapan; Lingkas (Tarakan): Ports of Celebes and the Moluccas—Makassar; Manado; Amboina; Bibliographical Note

XIV. ROADS 399

Introduction: Roads of Java and Madoera: Roads of the Outer Provinces: Road Traffic: Bibliographical Note

XV. RAILWAYS 414

Introduction: History of Development: State and Company Lines: Railways in Java: Railways in Sumatra: Bibliographical Note

XVI. SEA COMMUNICATIONS 442

Introduction: Inter-Island Communications: External Communications: Tanker Fleet: Government Marine: Native Trading Craft: Bibliographical Note

APPENDICES

I. Hinduism, Buddhism and Islam	451
II. Chief Towns and Cities	453
III. Posts, Telegraphs and Telephones	456
IV. Civil Aviation	465
V. Political and Economic Conditions in the Netherlands Indies from 1939 to 1944	467
VI. Sarawak	472
VII. Brunei	479
VIII. Labuan	481
IX. British North Borneo	482
X. Portuguese Timor	488

CONVERSION TABLES 490

INDEX 495

MAP OF JAVA (1 : 2,000,000) *in pocket at end*

MAP OF EAST INDIES (1 : 4,000,000) *in pocket at end*

SUMMARY OF CONTENTS OF HANDBOOK ON THE NETHERLANDS EAST INDIES

VOLUME I.

Geology and Physical features; Sumatra; Islands Adjacent to Sumatra; Java and Madoera; Borneo; Celebes; The Lesser Soenda Islands; The Moluccas; Dutch New Guinea; Climate; Soils; Vegetation; Medical Services and Health Conditions.

VOLUME II.

Peoples; History; Government, Administration and Law; Growth and Distribution of Population; Agriculture and Fisheries; Forestry; Mining and Industry; Labour; Commerce and Finance; Ports; Communications.

LIST OF MAPS AND DIAGRAMS

	PAGE
1. Languages of the Netherlands Indies	<i>facing 4</i>
2. The kingdoms of Sri-vijaya and Kediri in the eleventh and twelfth centuries	43
3. The empire of Majapahit in the fourteenth century	45
4. The Moluccas in the sixteenth and seventeenth centuries	51
5. Dutch acquisition of the native states of Java	57
6. Dutch acquisition of Java	58
7. The principal states in the East Indies in the seventeenth century	60
8. Dutch acquisition of the Outer Provinces	89
9. The administrative divisions of Java	118
10. The administrative divisions of the Outer Provinces	123
11. Distribution of population in the Netherlands Indies	133
12. Distribution of population in Java	134
13. Settlements in the coastal plain of Java east of Batavia	136
14. Settlements on the slopes of G. Tangkoebanprahoe	137
15. Settlements in the upland basin of Garoet	138
16. Settlements in the plains near Jogjakarta	140
17. Settlements in the valley of the Kali Brantas	142
18. Settlements in the southern coastal plain of central Java	143
19. Settlements near the mouth of the Kali Brantas	144
20. Increase of the native population in Java and Madoera, 1920-30	153
21. Settlements near the mouth of the Tjitaroem	158
22. Settlements on the slopes of G. Merapi	159
23. Distribution of chief towns and cities	161
24. Age-groups of the European population	165
25. Distribution of the Chinese population	166
26. Age-groups of the Chinese population	167
27. Percentage of area under native cultivation and under estates, Java and Madoera	171
28. Ploughing with oxen, Narmada, Lombok	173
29. Area of <i>sawah</i> , Java and Madoera	175
30. Proportion of vegetables, other than rice, in native diet	180
31. Proportion of pulses in native diet	181
32. Consumption of vegetable foods per head of native population	181
33. Distribution of <i>sawah</i> rice and of dry rice, Java and Madoera	183
34. Harvesting rice, Bali	184
35. Area under rice	185
36. Rice production	187
37. Distribution of sugar-cane and sweet potatoes, Java and Madoera	188
38. Area under sugar, Java and Madoera	191
39. Sugar production, Java and Madoera	191
40. Distribution of maize and cassava, Java and Madoera	202
41. Distribution of peanuts and soya beans, Java and Madoera	204
42. Distribution of tea plantations in relation to the number of rain-days	210

	PAGE
43. Plantation area (<i>cultuurgebied</i>) of the Oostkust Residency of Sumatra	212
44. Angling with a kite (<i>Manching lajang</i>)	225
45. Outrigger connectives	228
46. Small outrigger, north-west New Guinea	229
47. Relation between forest area and population density in the Netherlands Indies	234
48. Teak forests of Java	237
49. Area of teak forests in Java	238
50. Forests and forest reserves (excluding teak), Java and Madoera	244
51. Timber production, Java and Madoera	245
52. Growth of coal and petroleum production, 1900-37	248
53. Distribution of mineral resources	249
54. Distribution of oilfields	253
55. Oil production, 1930-40	254
56. The Palembang-Djambi oilfield	256
57. Growth of tin production	263
58. Batik-working in Java	272
59. Exports and imports, 1914-40	296
60. Prices of exports and imports, 1913-40	297
61. Stocks of sugar in Java, 1929-38	310
62. Rubber exports (estate and native), 1931-39	315
63. State debt, 1913-38	330
64. Tonnage of foreign trade at ports, 1938	340
65. Batavia (Tandjoengpriok)	<i>facing</i> 344
66. Batavia	<i>facing</i> 345
67. Cheribon	349
68. Tegal	350
69. Pekalongan	352
70. Semarang: the port	<i>facing</i> 352
71. Semarang: the town	<i>facing</i> 353
72. Soerabaja (Tandjoengperak)	<i>facing</i> 356
73. Soerabaja	<i>facing</i> 357
74. Pasoeroean	360
75. Probolinggo	361
76. Panaroekan	362
77. Kalianget	363
78. Banjoewangi	364
79. Tjilatjap	366
80. Sabang	<i>facing</i> 368
81. Oeleëlheuë	<i>facing</i> 369
82. Pangkalanbrandan (Pangkalansoesoe)	<i>facing</i> 372
83. Belawan	<i>facing</i> 373
84. Tangjoengbalai and Laboehanbilik	373
85. Rengat	375
86. Djambi	376
87. Palembang	<i>facing</i> 378
88. Belinjoe and Soengailiat	<i>facing</i> 379

	PAGE
89. Tandjoengpandan	381
90. Teloekbetoeng (Oosthaven)	382
91. Padang (Emmahaven)	382
92. Sibolga	385
93. Pontianak	387
94. Bandjermasin	388
95. Balikpapan	<i>facing</i> 388
96. Balikpapan oilfields	<i>facing</i> 389
97. Lingkas (Tarakan)	<i>facing</i> 392
98. Approach to Makassar	<i>facing</i> 393
99. Makassar	<i>facing</i> 394
100. Manado	<i>facing</i> 395
101. Amboina	396
102. Roads of western Java	401
103. Roads of eastern Java	403
104. Roads of Sumatra	406
105. Roads of Borneo	409
106. Roads of Celebes	410
107. Roads of Bali and Lombok	411
108. Roads of Lesser Soenda islands (excluding Bali and Lombok)	412
109. Freight traffic, J.S.S.	425
110. Gradients on Java railways	427
111. Railways of Java	<i>facing</i> 428
112. Railways of Sumatra	<i>facing</i> 429
113. Freight traffic, Z.S.S.	434
114. Freight traffic, S.S.S.	436
115. The West-Sumatra railway (S.S.S.) in the Padang region	438
116. Freight traffic, A.S.S.	439
117. Inter-island communications	<i>facing</i> 443
118. External communications	<i>facing</i> 445
119. Madoera trading prau	449
120. Sarawak	473
121. The town and bay of Brunei	480
122. British North Borneo	483

LIST OF PLATES

	FACING PAGE
1. Menangkabau girls, Sumatra	2
2. Batak man from northern Sumatra	2
3. Bahau Dyak from central Borneo	3
4. Papuan from Merauke, New Guinea	3
5. Javanese woman at market	8
6. Balinese girls weaving cloth	8
7. Javanese orchestra or gamēlan accompanying a puppet-show	9
8. } Puppets as used in Javanese shadow plays	10
9. }	
10. Boroboedoer	11
11. Boroboedoer: belt-shaped chaityas or cupolas on one of the circular terraces	11
12. Boroboedoer: sculptures on the outside walls, west side	12
13. Prambanan: part of a group of Hindu temples, dating from about the ninth century, A.D.	12
14. Tjandi Mendoet	13
15. Bas relief, Boroboedoer	13
16. Menangkabau house, Sumatra	18
17. Batak village near Berastagi, Sumatra	18
18. Atjeh house, Sumatra	19
19. Toradja village, Celebes	19
20. The <i>Baris Dadap</i> , Balinese dance	28
21. The <i>Rangda</i> , witch-widows in Balinese dance	28
22. <i>Barong Keket</i> , a mythical monster in Balinese dance	29
23. The <i>Redjang</i> , a Balinese dance	29
24. Fort Nassau, Bandanaira	52
25. Town Hall, Batavia	53
26. Palace of the Governor-General, Buitenzorg	108
27. Volksraad building, Batavia	109
28. Offices of the Preanger Resident, Bandoeng	120
29. Offices of the Governor of Oost-Java at Soerabaja	120
30. Town Hall, Medan	121
31. Berastagi, Sumatra	158
32. Native houses on the banks of the Soengai Belawan, Sumatra	159
33. Native houses on tea plantation near Soemedang, Java	159
34. Irrigation sluice on the Kali Serajoe near Banjoemas	178
35. Harrowing in flooded rice field, Bali	178
36. Rice fields, Bali	179
37. Terraced rice fields, near Pematangsiantar, Sumatra	179
38. Sugar-cane ready for harvesting, central Java	192
39. Sugar plantation and factory near Jogjakarta	192
40. Rubber plantation, Oostkust Residency of Sumatra	193
41. Palm oil factory near Pematangsiantar	193
42. Tobacco plantation near Medan	198

	FACING PAGE
43. Tea plantation and factory, Poerbasari	198
44. Cinchona plantation near Bandoeng	199
45. Cinchona factory, Bandoeng	199
46. Fishing with a small hand-operated shrimp net, Java	226
47. Fishing with a staked dip net, Celebes	226
48. Outrigger canoe, Bali	227
49. Fish market, Batavia	227
50. Tank park, Pladjoe	264
51. Bucket dredger, Billiton	264
52. Bauxite mine on Bintan island	265
53. Pit head at Sawahloento in the Oembilin coalfield, Sumatra	265
54. } Ancient Javanese batik work	272
55. }	
56. Portland cement factory at Indaroeng near Padang	273
57. Sisal factory, Soekamandi	273
58. Pottery market at Denpasar, Bali	306
59. Offices of the <i>Nederlandsche Handels Maatschappij</i> (N.H.M.), Batavia	307
60. Grounds and buildings of the Netherlands Indies Annual Fair at Bandoeng	307
61. Tandjoengpriok: No. 1 Basin	346
62. Tandjoengpriok: No. 2 Basin	346
63. Tandjoengpriok: Assembly plant, General Motors Ltd.	347
64. Tandjoengpriok: railway station	347
65. Tandjoengpriok-Batavia canal	348
66. Fishing harbour at Batavia	348
67. Batavia (Weltevreden): the Waterlooplein	349
68. Batavia (Weltevreden): the State railway station	349
69. Semarang: mouth of the Kali Baroe	354
70. Semarang: aerial view of town	354
71. Soerabaja (Tandjoengperak): general view of harbour looking north-west	355
72. Soerabaja (Tandjoengperak): mouth of the Kali Mas	355
73. Soerabaja (Tandjoengperak): Rotterdam and Amsterdam quays	358
74. Soerabaja (Tandjoengperak): Floating dock	358
75. Soerabaja: aerial view of town	359
76. Soerabaja: aerial view of Wonokromo suburb	359
77. Sabang: aerial view	370
78. Sabang: vessels at the coaling wharves	370
79. Belawan: Ocean Quay	371
80. Belawan: Government wharves	371
81. Tandjoengbalai	376
82. Palembang: Government wharf	376
83. Palembang: Pladjoe oil installations	377
84. Palembang: Pladjoe oil refinery	377
85. Tandjoengpandan	384
86. Emmahaven	384
87. Sibolga	385

88.	Pontianak: aerial view looking south	385
89.	Balikpapan	390
90.	Balikpapan: Sulphuric acid factory	390
91.	Sanga-Sanga oilfield near Samarinda	391
92.	Makassar: Juliana Quay	391
93.	Makassar: Entrance to the prau harbour	396
94.	Street in Makassar	396
95.	Manado: part of the town	397
96.	Amboina	397
97.	Semarang-Soerakarta road at Salatiga	404
98.	Bridge over the Enim river near Moearaenim	404
99.	Road near Barabai, south-east Borneo	405
100.	Road crossing Tjamba Pass, south Celebes	405
101.	Electrified line near Batavia	420
102.	Locomotive, 4-6-4T, for heavy passenger traffic	421
103.	Mallet locomotive, 2-8-8-0, of American build	421
104.	Goebeng workshops, Soerabaja	422
105.	Railway workshops at Bandoeng	422
106.	Bridge over the Tjiliwoeng, Batavia	423
107.	Viaduct on Cheribon-Kroja line	423
108.	Bridge over the Kali Brantas at Kertosono	430
109.	Maos Junction	430
110.	Viaduct over the Tjibesoro	431
111.	Headquarters of Semarang-Cheribon S. T. at Tegal	431
112.	A typical 'steam-tram'	432
113.	Headquarters of Semarang-Djoewana S. T. at Semarang	432
114.	West-Sumatra line in the Anaikloof	433
115.	West-Sumatra line alongside lake Singkarak	433
116.	The Atjeh Railway at Koetaradja	440
117.	Mixed gauge at Besitang	440
118.	Deli Railway at Medan	441
119.	Tank wagons at Medan, Deli Railway	441
120.	Vessel of the <i>Rotterdamsche-Lloyd</i> line at Sabang	444
121.	K.P.M. steamer at Gorontalo	444
122.	Bandoeng: modern shopping centre	454
123.	Jogjakarta: the main street	454
124.	Malang	455
125.	Medan	455
126.	Kuching, Sarawak	474
127.	Miri oilfield, Sarawak	474
128.	Jesselton, British North Borneo	475
129.	Sandakan, British North Borneo	475

Chapter I

THE PEOPLE

Introduction: Physical Types: Languages: Peoples of Java: Peoples of Sumatra: Peoples of Borneo: Peoples of Celebes: Peoples of the Moluccas: Peoples of New Guinea: Peoples of Bali and Lombok: Peoples of the Timor Group: Education: Bibliographical Note

INTRODUCTION

The Malay Archipelago has been of world importance for many centuries as a goal of commerce, and as a market for the exchange of goods between East and West. It has attracted maritime peoples who have left their mark on the population of the islands; sometimes they have mixed with the natives, and sometimes they have founded settlements retaining a separate identity.

It is uncertain whether land bridges between the western islands and Malaya and the eastern islands and Australia still existed when modern man first spread over this region, but communication has always been possible by sea; with favourable winds even primitive native craft can traverse the whole archipelago without losing sight of land for more than a few hours. To the east and south, however, beyond New Guinea and Australia, the vast expanse of ocean presents a formidable barrier to migration.

The line of advance would ordinarily be from the mainland on the north and west towards the islands in the south and east, but tribes driven up against the ocean barrier could retrace their steps and look for sanctuary in hills or remote islands which formerly they had left behind. Thus various peoples continually moved forwards and backwards.

During the long series of migrations throughout the archipelago there was much intermarriage between the later arrivals and their predecessors and, in cultural features, a mutual give and take. The final product was a common Indonesian culture, elaborate and distinctive, which still survives but, owing to local diversity in physical and economic environment and in the accidents of history, it has crystallized out in an innumerable variety of ways. Customs have changed slowly in the past and now change far more rapidly.

Peoples who lived in trees now dwell on the ground; even the most backward tribes use metal for their weapons and wear garments of imported cloth; hunters and fishermen are taking to agriculture; the family is yielding to the village as the unit of social life, and everywhere communal ideas are breaking down under the solvent force of individualism. The present chapter deals merely with the broad racial, linguistic and cultural distinctions of the native inhabitants; the immigrant groups are discussed in Chapter v.

PHYSICAL TYPES

At every stage the successive migrations of peoples in the Netherlands Indies brought about a mixture of blood and fusion of races, with a mutual interchange of speech and culture, so that over the whole area similar elements are differently combined, and form a motley pattern in remote hills and backwoods. Attempts to unravel the racial complex have multiplied confusion by inconsistencies in terminology. There is a general agreement in distinguishing an earlier stratum of inhabitants in the region, now difficult to trace except in isolated corners, and the main bulk of the modern population, composed of elements of successive invasions superimposed on the earlier elements. None of the main groups is homogeneous.

The earliest stratum seems to have been derived from peoples possessing either Australoid or Negroid characteristics. The typical Australoid is dark-skinned, hairy, of low stature, inclined to be narrow-headed (*dolichocephalic*), has a broad flat nose and ringletted hair which is elliptic in section. The Negroid type is also marked by a dark skin and broad flat nose, but the skin is smooth and the chief distinction is the woolly hair which is flat in section and tightly curled. Some, the Negritos, are short and rather broad-headed (*brachycephalic*); others, classed generally as Papuans, are moderately tall and ordinarily dolichocephalic. Some authorities regard the Negritos as the first men to reach south-east Asia; others give precedence to the Australoids.

In the Malay Peninsula Negritos are represented by the Semang, who, as the Orang Akit, stretch across into Sumatra. In Java there has been recognized a Negroid element which may be of Negrito origin, and the Kalang and Badoei have been regarded as partly of Negrito ancestry. Further east there are thought to be Negrito elements in Alor, Wetar and Timor, but in Borneo, Celebes and the Moluccas there is no evidence of the former presence of Negritos,



Plate 1. Menangkabau girls



Plate 2. Batak man

Most of the Batak live in the Toba lake region of northern Sumatra.

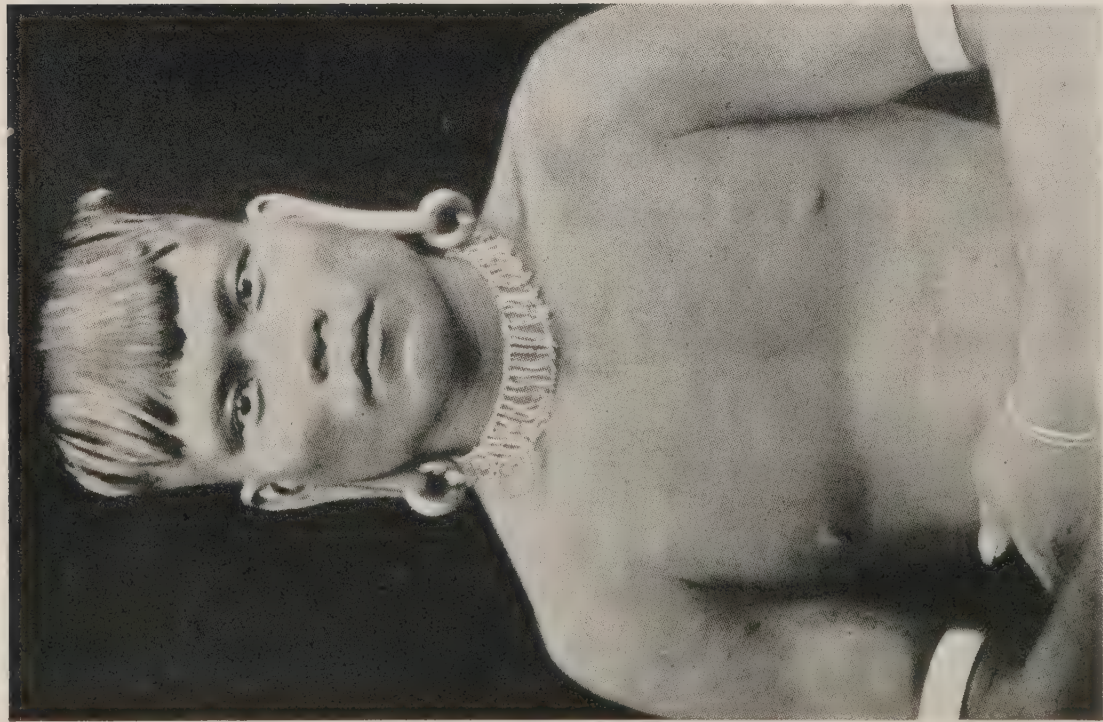


Plate 3. Bahau Dyak from central Borneo
Among the Dyak it is a common practice to distend the
ear lobes in the manner shown in the photograph.

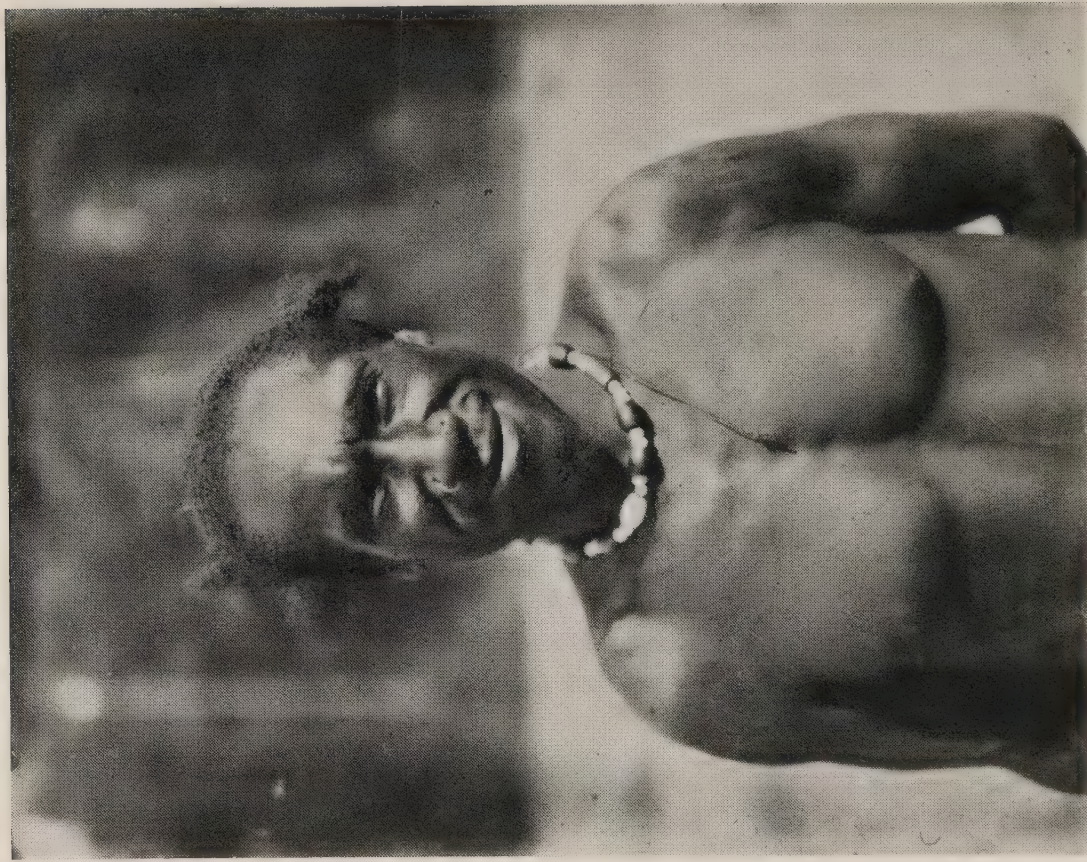


Plate 4. Papuan from Merauke, New Guinea

In New Guinea, however, Negritoes are represented by the Tapiro, the Nogulla and some other peoples of the mountain chain.

Australoid characters have been recognized among the Senoi in the south of the Malay Peninsula and among the Sakai and Koeboe of Sumatra. The presence of forerunners of Australoids in Java is thought likely from a fossil skull that was found at Wadjak in Kediri. The Australoid type is not uncommon among the Bodha of Lombok, and occurs among other culturally backward peoples in the Lesser Soenda islands eastwards to Timor. In Borneo it is represented among the Poenan, in Celebes among the Toala, and in the Moluccas among the Bonfia of Ceram. It would seem then that at one time Australoid peoples were distributed over the whole archipelago and Australoid traits can be found almost everywhere, even among the highly civilized Javanese.

Papuan elements have not been recognized in the archipelago, except in the eastern Moluccas and the Lesser Soenda islands. A Papuan strain is clearly apparent in Lombok and increases as one goes further east. The Papuans of New Guinea are of Negroid stock but are distinguished from the Negritoes by moderately tall stature and a hairy face and body (Plate 4).

Speaking generally the bulk of the present population derives from later immigrants who came in successive waves. It is generally agreed that there are two distinct constituents; the earlier one, with a brown skin, dolichocephalic, and with frizzly or wavy hair which is elliptic in section; the later one, with characteristic Mongoloid features, a skin tinged with yellow, brachycephalic, and with straight hair which is round in section.

The general agreement about racial composition is disguised by a clash in nomenclature of the peoples of the areas concerned. Certain peoples in Malaya and Sumatra have been known as Malays for centuries, and their language as Malay. These Malays were traders who settled in various ports, where the local people gradually adopted the language and all the people who spoke the Malay language came to be termed Malays. As the early Europeans came chiefly into contact with Malay-speaking peoples, the lands which these frequented came to be known as the Malay Peninsula and archipelago and the term 'Malay' gained a further extension to cover all the inhabitants of this region. Thus it had three connotations: the true Malays; the peoples who spoke the Malay language; and the peoples who lived in the Malayan region. About 1881 an attempt was made to clear up this confusion by applying the term Indonesia to the whole

Malayan archipelago, and this new usage found general acceptance when adopted by the German ethnographer Adolph Bastian in 1884. The inhabitants of this region then came to be known as Indonesians. But over the great part of Indonesia there was much in common between most of the languages, which were therefore grouped together as Indonesian, with a corresponding tendency to restrict the term as a racial name to those inhabitants of Indonesia who spoke an Indonesian language. Subsequently the connotation was extended to cover all the peoples from Formosa to Madagascar who spoke a similar language or in other ways showed an affinity with the more important peoples of Indonesia. One result of this process was that 'Indonesian' had no more exact significance than 'Malay'. Many writers use the term Malay and Indonesian as synonymous and, when necessary, distinguish the earlier dolichocephalic element as Ur-Malay, Proto-Malay or Pre-Malay. This seems to be the usual Dutch practice. Other writers confine the term Indonesian to the earlier dolichocephalic element, which they also term Pre-Malay, and reserve the term Malay for the Mongoloid element, distinguishing the earlier Mongoloid immigrants as Proto-Malay or Pure-Malay. Any reference to race, language or culture as Indonesian or Malay must therefore be read with caution. Of recent years it has become the practice to class the earlier dolichocephalic peoples as *Nesiot* (of Caucasoid stock), and the brachycephalic straight-haired peoples as *Pareoean* (of Mongoloid stock); this leaves Indonesian as a purely linguistic term for a group of related languages, whether spoken by Malays or others.

Nesiot characters have been recognized among many peoples in Sumatra, notably the Batak and Gajo and the inhabitants of the western islands, among some or most of the many kinds of Dyak of Borneo, and in the inland peoples of Celebes, known collectively as Toradja. In Java this stock is represented by the Tenggerese, and in the Lesser Soenda islands by the Sasak and Soembawanese (Plates 3, 6). Nesiot characters are shared by some peoples of continental India.

There is general agreement that the Mongoloid peoples came from eastern Asia, mostly by way of Malaya, and some by an eastern route through the Philippines. All the more advanced peoples are mainly Mongoloid. The chief peoples are: the Malays of the east coast, the Menangkabau and the Atjeher in Sumatra, the Soendanese, Javanese and Madoerese in Java, the Balinese and the coastal peoples of Borneo and Celebes (Plates 1, 2, 5).



Fig. 1. Languages of the Netherlands Indies

A. *Indonesian group*: 1. Sumatra; 2. Java; 3. Borneo; 4. Bali-Sasak; 5. Philippine; 6. Gorontalo; 7. Tomini; 8. Toradja; 9. Loinang; 10. Boengko-Laki; 11. South Celebes; 12. Moena-Boetoeng; 13. Bima-Soembawa; 14. Amboina-Timor; 15. Soela-Batjan. B. *Melanesian group*: 16. South Halmahera and New Guinea coast; 17. North New Guinea. C. *Papuan group*: 18. North Halmahera; 19. Interior of New Guinea.

Source: Based on *Atlas van Tropisch Nederland*, plate 9 (Batavia, 1938)

LANGUAGES

As the various peoples have migrated to and fro between the mainland and the islands, there has been a commingling not only of blood but also of cultural elements. This is apparent in their speech. There are two main types of language. The Indonesian languages extend as far west as Madagascar and have affinities with the languages of Polynesia. They have been grouped together as Malayo-Polynesian, but in 1899 the philologist Father W. Schmidt, of Vienna, coined the term Austronesian to comprise the Indonesian languages and also the whole Oceanic family including both the Polynesian and Melanesian languages. At that time little was known of the speech of the Semang, Sakai and other primitive peoples. But in 1906 Father Schmidt in his work *Die Mon-Khmer Völker* demonstrated that these, together with Nicobari and the Munda languages of India, were closely allied with the Mon-Khmer group, and he gave them all the common name of Austro-Asiatic. He also showed that there is a connection between the Austro-Asiatic and Austronesian groups and classified them together as Austric (Fig. 1).

Distributed among the Austronesian languages, but sharply different, are other languages spoken mainly in the interior of New Guinea, and therefore called Papuan. In the Netherlands Indies the languages of northern Halmahera, Ternate and Tidore belong to this group; in the south of Halmahera and on the coasts of New Guinea, the languages, although containing Papuan elements, are classed under the Melanesian family of the Austronesian group. Elsewhere in the archipelago Indonesian languages alone are found, and even the primitive peoples, who on the mainland retain their Austro-Asiatic speech, have abandoned it for some Indonesian language borrowed from their neighbours. Thus over practically the whole area there is a fundamental unity of language. But this is concealed by a many-coloured pattern of local speech. In all the larger islands and in many of the smaller, each people has its own language, and over the archipelago as a whole some two hundred distinct languages have been recognized. They can be divided schematically as follows:

- A. Austro-Asiatic (South-east Asiatic)
 - Malaccan group
- B. Austronesian
 - (i) Indonesian
 - 1. Sumatra group with 15 main languages
 - 2. Java group with 3 main languages
 - 3. Borneo group with 5 main languages

4. Bali-Sasak with 3 main languages
5. Gorontalo with 4 main languages
6. Tomini
7. Toradja group with 8 main languages
8. Loinang group with 4 main languages
9. Boengko-Laki with 5 main languages
10. South Celebes with 7 main languages
11. Moena-Boetoeng with 4 main languages
12. Bima-Soemba with 6 main languages
13. Amboina-Timor with 22 main languages
14. Soela-Batjan with 3 main languages

(ii) Melanesian

South Halmahera, New Guinea coast, etc.

C. Papuan

Interior of New Guinea, north Halmahera, etc.

PEOPLES OF JAVA

Javanese

Of the three chief peoples of Java the Javanese are by far the most numerous, and on other grounds also they may claim to be the most important; under both Hindu and Muslim rule they were the leading group, and they have the fullest history and most extensive literature. Their homeland lies in the eastern two-thirds of the island, with the Soendanese in the west and the Madoerese in the island of Madoera off the north-east corner. At the present time Javanese are found in considerable numbers in Soendanese territory and in the Outer Provinces; to some extent, however, they have given place to the Madoerese in the north-east of the island.

Almost without exception the Javanese profess Islam*, but their beliefs and practices are strongly tinged with the Indian creeds that prevailed for nearly a thousand years before their conversion to Islam, and still more strongly coloured by their ancient belief in spirits and magic. The mountains, woods and rivers are all inhabited by spirits and the villages are alive with ghosts. Each village has its protective spirit, and each family reveres its ancestors. The boys are circumcised at about twelve years of age and marry, according to Muslim rites, at fifteen or sixteen, though the age of marriage is tending to grow later. The girls are incised at about six years old. The women go unveiled and enjoy a notable degree of freedom; one often sees husband and wife walking side by side or hand in hand, or groups of two or three women admiring the goods in shop windows. Of late years many townswomen have taken to office work and not a few ride bicycles. Formerly they used to marry at twelve or thirteen,

* See Appendix I.

but, as with the men, the age of marriage is tending to grow later and among the official classes they often do not marry before twenty. The marriage is arranged by the parents, but the boy at least has some say in the matter. It is usual for the men to pay a bride price.

The social organization is strongly aristocratic and the people have a great regard for rank and titles. Despite the long prevalence of Hinduism the caste system has never taken root. Four grades (*standen*), however, are generally recognized. These are based on property. Those who hold rice land are in the first grade; then come those who hold garden land; next are those with house sites but no land, and the lowest class are those who have no permanent residence — ‘inn-lodgers huddled together in a corner’. The village usually consists of a large complex of houses surrounded by a communal village fence and lying within a circle of communal rice lands. There may be four or five thousand inhabitants; a village with only a thousand is reckoned small, and there are not many with less than five hundred. Formerly, the typical Javanese village had much in common with the Hindu village community and, like it, was a self-contained social unit. There was an elaborate village government which, even in its simpler forms, comprised a headman, a clerk, a priest, two or three subordinate headmen and policemen, and messengers. These were paid by an allotment of village land or by customary contributions from the villagers; sometimes there were village artificers similarly paid. All the land was village land; some was allotted for the support of village officers, some was held as common property for grazing or other purposes, or might be leased to tenants paying rent to the village; the rest of the land was occupied for a year or longer in turn by the hereditary land-owning families.

During recent years this traditional organization has undergone considerable changes. The Culture System, under which part of the land was cultivated with export crops for the government, increased the power of the village headman, and made landholding a burden that the people endeavoured to avoid. With the Liberal reaction against the Culture System the encouragement of individual landholding weakened village ties, but the so-called ‘ethical policy’ of the present century has aimed at strengthening the village in its corporate capacity. Local officials used their personal influence to induce the villages to raise money for the building of bazaars, village halls, for road making, street lighting and so on. The Village Regulation of 1906 gave a legal basis to such activities. Before long almost

every village had its treasury to provide funds for everything that the local official thought the village ought to want, such as a school, a village bank, a stud bull and a pedigree goat. Every village was expected to hold periodically a village meeting to settle its affairs, and elaborate regulations provided for the conduct of these meetings on democratic lines. But in the opinion of competent observers very little of the former village autonomy remained. At the same time village boundaries were often readjusted with a view to increasing administrative efficiency. Thus the modern village has lost much of its original character and, with the growth of trade and the improvement of communications, is no longer self-contained and self-sufficient.

The Javanese house diverges notably from the normal pattern in the archipelago; instead of being raised on piles it stands level with the ground and the floor consists of earth flattened and made hard by stamping. The walls are ordinarily of bamboo, and the roof of palm leaf, with house posts of wood and cane. There is no window, but sometimes a square trellised aperture in one or more of the walls. The sleeping chamber is partitioned off from the living room, and the better type of house has a verandah and a bath room. The furniture is simple; a wooden settee, serving as bed or couch; one or two mats and a few cushions; a table, two or three chairs, a wooden chest and a kerosine lamp. Nowadays even the poorest will probably have a teapot with cups and saucers. Round almost every house there is a small garden, planted with palms, fruit trees and vegetables. Wherever possible there is a small stream or pond in which fish, usually a species of carp and by preference gold fish, are cultivated (see p. 231).

The men wear a kerchief of coloured cloth, twisted round their head; when at work in the fields they wear also a hat of bamboo or plaited grass. The jacket is of white cloth, tight round the neck and hanging loosely round the hips. Mostly they wear cotton shorts, and over these a skirt of coloured cloth, consisting either of a single length with both ends free (*kain*) or, more often, of a piece with the ends stitched together (*sarong*); ordinarily the skirt reaches down to the ankles, but when at work it is girt up round the waist. The skirt is secured by a leather belt. The cultivator usually carries a pointed knife, and the aristocracy on ceremonial occasions wear the kris or dagger. Except for officials and townsfolk they mostly go barefoot. The dress of the women looks much like that of the men, but they also wear a brassière (*kemben*) and a scarf (*slendang*) in which they



Plate 5. Javanese woman at market



Plate 6. Balinese girls weaving cloth



Plate 7. Javanese orchestra or gamelan accompanying a puppet-show

The man in the centre of the photograph is the *dalang* who operates the puppets, speaks all parts of the play, and directs the music. The audience, which sits on the other side of the white screen, sees only the shadows of the puppets.

carry their babies or their goods. They wear nothing on their heads but deck the hair with pins and flowers and are fond of large and costly ear-rings.

The staple diet consists of rice and fish, either as dried fish, fish paste or fish sauce, and varied with vegetables. Their other wants are simple: betel and a *strootje*, a native cigarette flavoured with clove, satisfy most of their requirements. Being Muslims, they are little given to alcohol, but some are fond of opium.

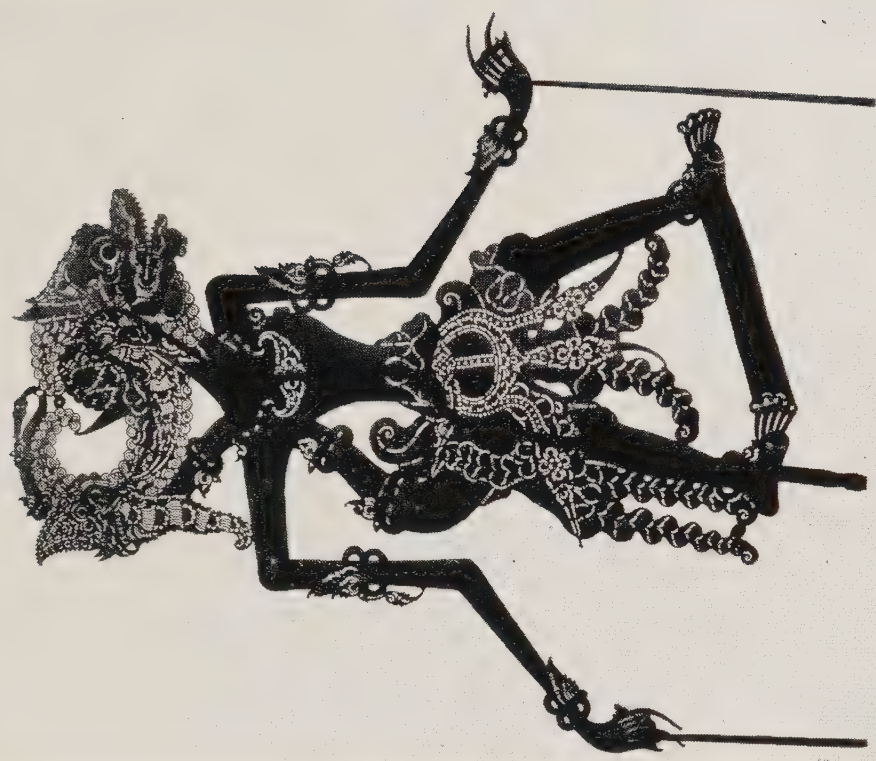
The main occupation of almost every villager is agriculture, especially the cultivation of rice. The present system of communal tenure arose under the Culture System, when land holding was a burden rather than a privilege. The occupation of land is confined to certain families, and formerly the land was redistributed annually. Now that land is an asset much of it is held for life by the same man and may pass to his heirs at death. Individual holdings are small and scattered in minute parcels. The Javanese is a diligent and, by oriental standards, an efficient cultivator. Of late years there has been much progress in the cultivation of crops for sale, but the world economic depression caused a setback in this movement. Before the depression a large number of cultivators found part-time employment on the sugar plantations. Almost every regency has its characteristic art or craft, but these are rarely of more than local importance. Apart from agriculture the chief occupations are batik-printing, weaving, hat-making and, along the north coast, fishing. Batik, a primarily Javanese industry, is a method of producing coloured designs on cloth. The first part of the design is drawn on the cloth and then everything except the part to be coloured is covered with molten wax from a funnel-shaped instrument. After the first dyeing the wax is melted off with hot water and the next part of the design treated in the same way and the cloth dipped in dye of another colour. The process is repeated until the complex design, usually of plants, birds or butterflies, is complete. There are hundreds of these traditional designs, some of which are peculiar to particular districts, while others are reserved for princely families (Plates 54, 55). Batik is chiefly centred at Jogjakarta, while weaving is widespread (Fig. 58). In recent years the government has encouraged the use of machinery, with no little success; but it has been found, contrary to anticipation, that hand looms are often more profitable. The only large-scale native industry of any great importance is the manufacture of cigarettes for native consumption. The people take little part in commerce, except in petty retail trade, conducted largely by the women. Carting has

long been an important subsidiary means of livelihood, and during the past twenty years many people have taken to driving motor-buses and taxis.

Javanese is the chief literary language of the archipelago and has an extensive literature, chiefly poetry and chronicles, dating back to the eleventh century. The two great Sanskrit epics, the *Mahabharata* and the *Ramayana* cycles, have always been a source of inspiration for Javanese literature. The *Mahabharata*, which has enjoyed more popularity in Java than the *Ramayana*, relates the struggle for supremacy between two branches of the royal Bharata family, which culminated in a war between cousins. The two most famous local chronicles are the *Nagarakrtagama*, written in the fourteenth century and giving an account of the founding of the Majapahit empire, and the *Pararaton* which was composed about the end of the fifteenth century. The modern nationalist movement has stimulated literature, and the development of Javanese as a means of bringing the people into touch with the modern world has been encouraged by the government through the Bureau for Popular Reading (see p. 36). The script is of Indian origin.

There are three forms of the spoken language with many subsidiary varieties. One form is used by superiors to inferiors and by the common people amongst themselves; a second is used when addressing officials, and the third is the language used when addressing native princes. There seems, however, to be a tendency to simplify these complications.

The favourite pastimes are music, dancing and the *Wajang Koelit* or shadow play. The music, based on the pentatonic scale, is highly developed and is pleasing even to European ears. Men and women do not dance together and there is little ordinary dancing for amusement. Most of the dances consist of movements expressive of some emotion or mental state and the dancer is generally accompanied by the intricate rhythms of the *gamelan* or Javanese orchestra, though in a few dances the accompaniment is provided by a professional female singer. The two most distinctive styles are the *solo* and the *djogja*; they differ in the way the arms are lifted and in the foot and leg movements. The *solo* style creates a serene impression while the *djogja* involves more vigorous action. The majority of the dances are comparable with the European ballet and are performed by groups of four or eight professional dancers. The *srimpi* and *badaya* are dances of this type performed by female dancers in the privacy of the *kraton*, or palace, of the Javanese princes.



Plates 8 and 9. Puppets as used in Javanese shadow-plays



Plate 10. Boroboedoer

A general view showing the massive scale on which the Buddhist *stupa* is constructed. The *stupa* consists of ten terraces, the lower seven being square, the upper three circular. A great bell-shaped *stupa* (the *dagob*) crowns the highest terrace.



Plate 11. Boroboedoer: bell-shaped *chaityas* or cupolas on one of the circular terraces. Each of the *chaityas* or cupolas contains a statue of the Buddha similar to the one seen in the foreground.

The *gamēlan* varies in detail from place to place but the description of one by A. R. Wallace* at a village near Modjokerto gives a clear idea of the chief types of instrument: The instruments 'are chiefly gongs of various sizes, arranged in sets of from eight to twelve, on low wooden frames. Each set is played by one performer with one or two drumsticks. There are also some very large gongs, played singly or in pairs, and taking the place of our drums and kettledrums. Other instruments are formed by broad metallic bars, supported on strings stretched across frames; others again of strips of bamboo similarly placed and producing the highest notes. Besides these there are a flute and a curious two-stringed violin, requiring in all twenty-four performers. . . . The general effect was very pleasing, but, owing to the similarity of most of the instruments, more like a gigantic musical box than one of our bands'. The *gamēlan* of Bali is similar to that of Java. The *Wajang Koelit* is the chief form of dramatic entertainment, but there are also puppet shows (*Wajang Golek*). The *Wajang Koelit* is the most popular entertainment among the Javanese and is in fact more than an entertainment for it is a combination of literature, music and handicraft and also teaches a philosophy of life. The audience sits in front of a white screen behind which is the *gamēlan*, the puppets, and the man who operates them (*dalang*). An oil lamp is suspended above the head of the *dalang* so that the shadows of the puppets alone are thrown on the screen. About two hundred puppets are used and the *dalang*, in addition to operating the puppets, speaks all the parts in the play, both male and female, and directs the music (Plate 7). The characters are taken from the *Mahabharata* and the *Ramayana* and the plots also come largely from the same source. In later times artists, mostly unknown, have created new stories which do not really belong to these epics; the use of the same characters, however, provides the necessary link with them. The spectator sees on the screen heroes performing gallant deeds, and villains and traitors executing their foul intentions. The screen is therefore compared with the stage of the world and the *dalang*, invisible to the audience, to Providence which knows and plans all worldly happenings. The religious element in the *Wajang* is emphasized by the *dalang* performing some rite, such as the burning of incense while a prayer is uttered. Performances by living actors (*Wajang Wong*) are comparatively modern, having been introduced by the sultan of Jogjakarta in the eighteenth century. They are rarely given on account of their expense. The cinema is

* A. R. Wallace, *The Malay Archipelago*, 3rd edition, p. 103 (London, 1872).

popular, but only a few films with local actors have been produced and these under European direction.

The art of architecture suffered an eclipse in Java when Islam replaced Buddhism as the religion of the people; it reached its greatest perfection in the Sailendra period (see p. 41) when Boroboedoer and other great Buddhist temples were built. With few exceptions, these temples were completely deserted and their ruins often lost sight of until rediscovered in the nineteenth century.

Boroboedoer, the largest and best known of the Buddhist *stupa* in Java, was built in the eighth century A.D. It is constructed on and around a hill and consists of seven angular galleries surmounted by three circular terraces. The walls of the galleries are carved in bas-relief and depict, among other themes, the life story of Buddha; in addition they have hundreds of niches, in each of which is a statue of Buddha. The circular terraces have seventy-two bell-shaped *chaityas* each holding a life-size image of Buddha (Plates 10-12, 14).

Sivaism as well as Buddhism gave rise to great temples, the best known example of which is that of Tjandi Prambanan (Plate 13).

The group of temples, known as Panataran, near Blitar in central Java, was built in the tenth century and is of special interest as some of the buildings have been completely restored. The carvings show episodes from the *Ramayana*. The mosque at Koedoes is a rare example of a Buddhist temple which continued to be used for religious purposes after the change to Islam. The only other example of this in Java is a mosque at Grisee near Soerabaja.

Soendanese

Much that has been said of the Javanese applies also to the Soendanese. The Soendanese, however, is much more cheery and light-hearted, and, although his costume resembles that of the Javanese, he indulges in brighter colours. The house is built on piles instead of on the ground. The homeland of the Soendanese is among the Preanger hills and, though rice is the chief crop, the situation favours a wider variety of cultivation. The village is not a single large complex but a collection of hamlets each comprising several distinct groups of three or four houses. The rice lands and other lands are held in individual possession. Arts and crafts resemble those of the Javanese, but there is no batik work, and drama and dancing are less developed.

Madoerese

In Madoera there is little rice land. The people live a harder life

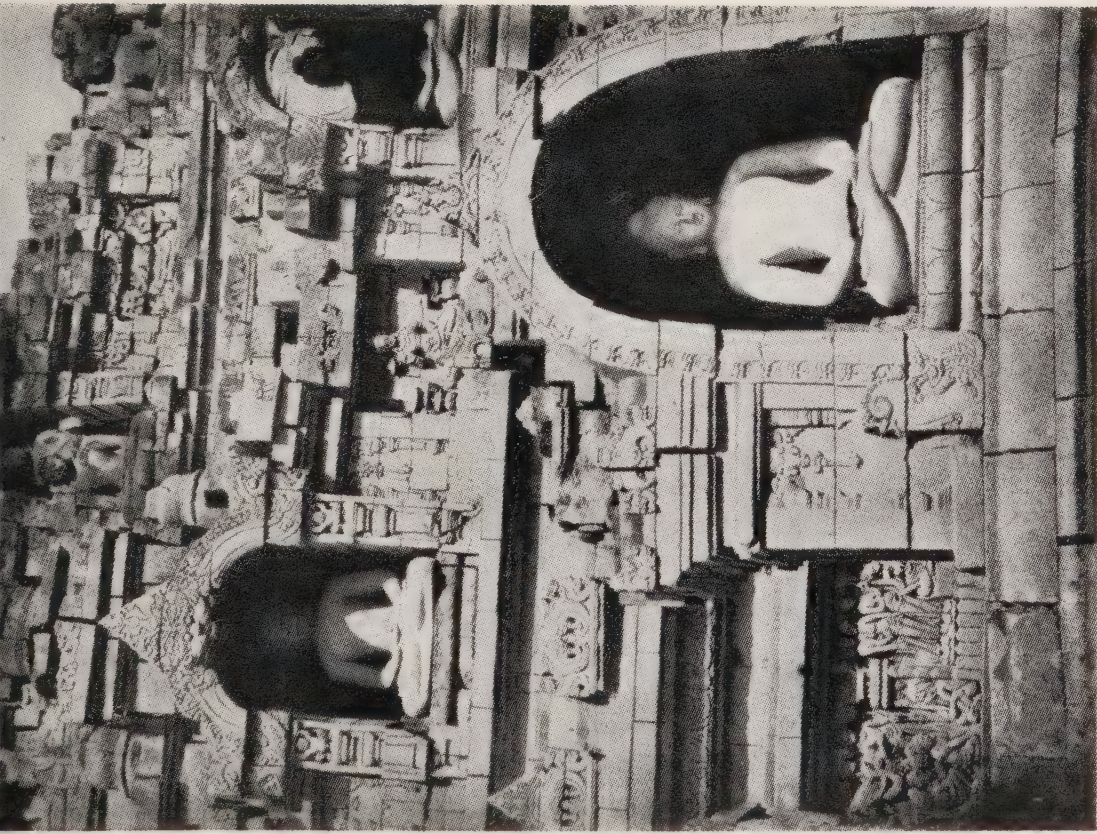


Plate 12. Borobuodoer: sculptures on the outside walls, west side. The walls, which enclose the terraces, are elaborately sculptured. There are altogether 432 niches, with statues of the Buddha in each one.



Plate 13. Prambanan: part of a group of Hindu temples, dating from about the ninth century A.D.



Plate 14. Tjandi Mendoet

This beautifully proportioned and richly carved Buddhist temple was built about the same time as the Boroboedoe *stupa*.



Plate 15. Bas relief, Boroboedoe

The carvings on the walls of Boroboedoe are particularly fine. They represent Hindu myths and legends as told in the *Ramayana*.

and, though less intelligent than the Javanese, have more persistence. The typical Madoerese village is widely scattered over many tiny hamlets of four to ten families. The chief crop is maize, but the principal means of livelihood is cattle breeding. The cattle require a large area for grazing, and as they are stabled in the compounds, the Madoerese village is uncleanly. Near the coast, where cattle are fewer and fishermen predominate, the villages are larger and, when Madoerese settle in Java they form large villages much like those of the Javanese, except that the land is held in individual possession. The chief pastime of the Madoerese is cattle racing, and successful racing-cattle are very valuable.

Other Peoples

Among the minor peoples of Java may be noted the *Tenggerese* and the *Badui*. They seem to have a large admixture of earlier stocks and their religion is a degenerate Hinduism. Both are hill peoples, the former living in the Tengger-gebergte of Oost-Java and the latter west of the Preanger hills in West-Java. Maize is their chief crop. The *Kalang*, formerly a distinct people of foresters, have now been absorbed in the general population.

PEOPLES OF SUMATRA

Apart from backward tribes the peoples of Sumatra fall into three main groups: Malays, stretching across the middle of the island from east to west and represented chiefly by the Menangkabau and the Coastal Malays; the Batak and Lamponger, respectively north and south of the Malay belt; and the Atjeher in the extreme north-east showing affinities with both Malay and Batak, strongly coloured by influences from outside. Presumably successive immigrations of Malays from the mainland drove the earlier peoples to the west, north and south. At the present day there are numerous distinct peoples with customs showing a wide range of variation on a pattern fundamentally similar.

Menangkabau

The Menangkabau extend from the middle of the island to the west coast; they are Muslim, but their social organization is strongly matrilineal. Four main lines (*Soekoe*) are recognized, but these are divided into about twenty-five groups in each of which numerous families trace their descent through the female line to a common

ancestress. Inheritance is in the female line and the children derive through the mother their names, property and privileges; in default of children the inheritance passes to the brother, sister or sister's children. Marriage within the group is prohibited. On marriage the woman remains with her maternal relatives and the man also stays in his former home; the head of the new household is the wife's brother or an older male relative on the maternal side, who is responsible for managing the family property. With the spread of Western education this form of social organization is found increasingly irksome and inconvenient. As well as the kinship organization there is also a territorial distribution into village tracts. The village tract usually consists of a chief village and subordinate hamlets, each with its own ring of cultivation and waste land. Within the hamlet the people are grouped by families. The village tract has its own village government, embodied in the descendants of the original founders of the settlement, the 'parent-families'. Ordinarily there is a Council House (*balai*) for village meetings and a hut where there hangs a wooden gong used for warning and for summoning the people; there is usually a market square, shaded by a large tree.

Within the hamlet each distinct group of families ordinarily occupies a common family house. In some parts the houses stand separately each in its own compound, growing fruit trees and vegetables and with outhouses for grain and cattle; in other parts the houses are clustered together in a common enclosure. The floor is some four or five feet above the ground, supported by poles which reach up the roof and divide the house into separate compartments. A ladder goes up to a large living room and at the back of the house are separate rooms for each of the families; sometimes annexes are available for distinguished guests. The form of the house is characteristic. The roof has the shape of a saddle, ending on either side in a point resembling a horn; not infrequently there are two horns in the middle and sometimes also on the annexes. The roof is often ornamented with flowers and beaten tin, and the walls are elaborately decorated with paint and carving, as also are the weapons and utensils (Plate 16).

The dress shows many local variations in detail but nowadays is usually of the Malay type (Plate 5). The men wear a kerchief and short trousers when at home or working in the field, but put on a *kain* or *sarong* and vest and jacket for full dress; the women wear a *sarong* and *slendang*. The boys are circumcised and the girls incised.

The ears of the girls are bored while they are very young, and their teeth are filed before marriage.

The staple food is rice, with vegetable supplements. The chief occupations are agriculture and trade, with fishing and various crafts as subsidiary means of livelihood. The chief food crops are rice and maize, and, among other crops, pepper, coffee and tobacco are important. The standard of agriculture is high and great ingenuity is shown in irrigation; less attention is paid to cattle breeding, and oxen are less carefully bred than buffaloes. The Menangkabau are notoriously keen traders and are almost the only people of the archipelago who have been able to hold their own in trade against the Chinese, but they have made little progress in commerce on a large scale. They are famous as craftsmen, notably in filigree work and in the casting of bronze, as well as in painting and wood carving, and artistic sensibility is widely spread. The literature is traditional and poetic, and the customary laws are preserved in writing. The script now used is Arabic.

Redjang-Lebonger

The Redjang-Lebonger, who are often classed as two separate peoples, have affinities both with the Menangkabau and the Coastal Malays. They inhabit the tract between Palembang and the west coast. They are nominally Muslim, but are lax in their religious observances and the majority remains uncircumcised. The social organization is patrilineal, each large family (*marga*) having its own male chieftain. The Redjang show Javanese influence and their houses resemble those of the Javanese, though standing on piles and not on the ground level. Among the Redjang the forehead is artificially flattened. Most of the men speak Menangkabau, but the native tongue is Redjangese, which has a fairly extensive literature in a script of Indian origin. Other west coast peoples of Malay type are the Serawaier of Benkoelen and the Oeloeanese of Tapanoeli. The former closely resemble the Malays of the east coast except in their dialect. The latter, though reckoned as Malays, are less civilized and appear to have Dravidian affinities; during recent years many have adopted Christianity.

Coastal Malays

The Malays of the east coast differ markedly from those of Menangkabau. The most typical representatives are those classed in the census as Melajoe, who form the bulk of the population of the Oostkust and Riouw Residencies. Their religion is Islam, and the

social organization is patrilineal. The villages are almost always beside a stream. The houses stand some five feet above the ground; the walls are wood or cane with a roof of palm leaf. The men wear a *sarong* and usually trousers, a short jacket and a kerchief; the women wear a *sarong* and a long jacket. Both men and women love bright clothing and ornaments. The main occupation is agriculture with rice and tobacco as the chief crops. Many are fishermen and boatmen, and they take readily to the sea, so that throughout the archipelago the coastal peoples are largely of Malay origin and the Malay language is generally understood. The script is Arabic, and there is a considerable literature largely religious.

The Malays of Palembang Residency, often distinguished as Palembangers, closely resemble the Melajoe and trace their origin to Malacca, but they show many signs of Javanese influence. In Djambi Residency there is a strong Menangkabau element, and matriliney is found. Other minor peoples on the mainland are the Pasemaker, Ampatlawanger and Semendoe, all closely allied. The Pasemaker, who extend over into Benkoelen, claim to have come from the old Javanese kingdom of Majapahit. Among the Semendoe, the man pays a bride price but moves to his wife's village.

The natives of Bangka and Billiton, though regarded as Malays and professing Islam, are very backward in culture and seem to have an aboriginal strain; they claim to have come from Palembang. There are three groups: the Orang Goenoeng or hill-folk; the Orang Doeroet or land-folk; and the Orang Sekah or sea-folk. The social organization is simple with little distinction of classes, and the headmen are not greatly respected. Cultivation is mostly of the shifting type.

Batak

The term Batak seems at first to have been applied generally by the Coastal Malays to the people of the interior as being heathen, wild or uncivilized, but it has been adopted as their proper name by a number of separate tribes falling into two main groups: the Daïri, comprising the Karo and Pakpak tribes, and the Toba, including all the other tribes. Though found mainly in the uplands round lake Toba, they touch the coast near Natal. The southern tribes are now Muslim and those of the centre largely Christian; in the north the cult of local and ancestral spirits still survives, but is coloured by Hinduism and is more systematized than is usual where similar beliefs prevail. Some tribes preserve the skulls of deceased ancestors.

Cannibalism survived locally until the present century. Shamanism has a strong hold on the people and the shamans are almost always women and hereditary; the spirit possessing the shaman speaks through her and not merely, as is usual in the eastern islands of the archipelago, to the shaman. The social organization is based on the family group (*marga*), and is strongly patrilineal. Marriage is exogamic. The man pays a bride price for the woman, who leaves her own tribe and family for that of the husband. Polygamy is not unusual. Wives and daughters have no share in the inheritance.

The village has now taken the place of the family as the unit of government. The village community consists of the descendants of the original family together with those who have been admitted to it by marriage or settlement. The headman administers the village with a council of elders. In some villages the land is held in common by members of the *marga*, but there is a wide variety of tenures. The Toba village consists of several small hamlets, each of six or seven family households in two parallel rows separated by a vacant space or street. The Karo settlements are usually large, with the houses irregularly grouped in a cruciform pattern round a village square. The Karo village is surrounded by a hedge and trees, but in some tribes the village is protected by an earthen wall or bamboo palisade. In most villages there is a plot of vacant land for village meetings, and a bachelors' house, where the young men and strangers sleep; in the south the girls likewise have a separate communal house. The houses stand on piles and are often eight feet above ground level. The typical Batak house has a saddle-shaped roof with pointed ends decorated with buffalo horns, and the walls are often elaborately carved. There is one large room, divided up at night into separate family compartments, and a dozen or more families may occupy a single house. The Karo houses have a long passage with the separate compartments on either side and a balcony at each end. The Pakpak houses have a central hearth with a gallery for the women in an upper storey. The Toba houses are often little more than huts of straw or clay (Plate 17).

The Batak have now taken generally to Malay, or even to European costume, but in the more remote villages the people wear no more than a wrap of home-spun, home-woven cloth from the loins downwards, to which the women add a cloth round the breasts; the Karo chiefly affect blue and the Toba brown. The teeth are filed; with boys this is done at puberty or rather earlier and with girls at about seven years of age. Incision is practised on boys at puberty and on

the girls at about seven; in the south this has been replaced by Muslim circumcision. Some Batak insert little round stones beneath the foreskin of the penis. The chief occupation is agriculture, with rice as the main crop. The Batak have profited greatly from education in the mission schools and are now found all over Sumatra and elsewhere as clerks, teachers, doctors, surveyors and so on. In the Batak country the trade is mostly in the hands of Malays, but many Batak make a living as shopkeepers and traders along the coast. The literature, in a script of Indian origin, is not extensive, but a large stock of legend and romance is handed down orally, and listening to this is a favourite pastime.

The Gajo, further north, show some affinity with the Batak, but have for the most part adopted the culture of the Atjeher by whom they are surrounded and to whom they have long been subject. In the inheritance of property the residue of the estate passes to the youngest son.

Lamponger

The Lamponger in the south of Sumatra have cultural affinities with the Batak but have been strongly influenced by the Soendanese, their neighbours across Soenda strait. This influence is chiefly apparent among the Orang Pablan, the people of the plains, who differ in many respects from the hill-folk, the Orang Aboeng. Although Muslim, the practice of head-hunting persisted, especially among the hill-folk, until suppressed by the Dutch. There are five provinces divided into smaller districts (*mega*, the equivalent of the Batak *marga*) and subdivided into villages. The social system is patrilineal with complicated marriage rules. The man pays a bride price for the woman who joins his family and leaves her own; after the man's death the woman passes to his brother or other male relation.

The villages lie alongside a stream and usually comprise several distinct hamlets. The houses, built of bamboo, stand in separate compounds on piles high above the ground; they often have two and sometimes three storeys, with many rooms on each floor; the walls are painted and decorated. In the middle of the main village there is a communal house where the village council meets, feasts are held and strangers may find lodging; a similar house is found in each of the subordinate hamlets. The Malay costume has been generally adopted; some of the cloth is home woven and the art of weaving is further advanced than among the Batak. The food is



Plate 16. Menangkabau house, Sumatra



Plate 17. Batak village near Berastagi, Sumatra

This village is inhabited by the Karo tribe of Batak. The houses are built on piles. Buffalo horns adorn the pointed ends of the roofs.



Plate 18. Atjeh house, Sumatra



Plate 19. Toradja village, Celebes

simple, mainly rice and vegetables; fish and flesh are little eaten. Agriculture is the chief occupation, and pepper is an important crop. The general standard of culture is high, and the custom by which boys and girls exchange love letters has encouraged literacy; the script is of Indian origin.

The Benkoelen and Kroë peoples have much in common with the Lamponger but have come more closely under the influence of Malay culture.

Atjeher

The Atjeher comprise numerous tribes in the extreme north. The coastal people have been strongly influenced by foreign contacts and differ in many respects from those of the interior, but the war against the Dutch (1873-1900) welded them all together into a common nationality. They are Muslims, fanatical but not strict. The social organization is aristocratic, with a division into nobility, commoners and those of servile origin. Class distinctions though sharper than among the Batak, are less marked than in the areas penetrated by Javanese influence in south Sumatra. Society is built up on the family group and four main groups (*kawom*) are recognized, but its genealogical character is now disguised beneath a territorial arrangement dating from the adoption of Islam and later systematized by the Dutch. At marriage the man pays a bride price, but the woman remains in her own home, where the husband either visits her or joins her. The children are brought up by the mother and the father may see little of them, but he accepts responsibility for their welfare. Polygamy is unusual, and so also is divorce.

The villages are grouped for religious observances and originally there were four villages to a mosque, the latter standing between the villages that it serves. The number of houses in a village varies widely; sometimes they are grouped within a ring fence and sometimes scattered. Each village usually contains members of all four *kawom*. A communal house serves for village meetings and prayers; formerly the bachelors slept there, but this is now unusual though it is still used as a rest house for strangers. Each house stands in a fenced compound, planted with fruit trees and containing the granary and cattle shed. The houses are built on piles, and are divided into several rooms with a verandah at the back and front; often there is an annex for unmarried daughters.

Both men and women wear baggy trousers; the rest of their costume, jacket, vest and skirt differs locally. Circumcision is

practically universal and apparently pre-Muslim; incision is customary with girls. Both sexes file their teeth; the boys as soon as the permanent teeth arrive, and the girls after marriage, but among the latter the custom is obsolescent. The usual food is rice, with fish and vegetables; almost all chew betel and many smoke opium, but few take alcohol. Agriculture is the chief occupation; the land is held in common but cultivated by individuals, not communally. Rice, pepper and sugar are the chief crops. Silk weaving is a considerable industry and there are goldsmiths, woodcarvers and shipwrights. The literature, mainly religious and romantic, is in the Arabic script. The people are musical and delight in competitions in the recital of poetry. They are great gamblers and keep animals for fighting.

More Primitive Tribes

Among primitive peoples distinctive characters mark the Orang Akit, living on the Soengai Mandau, a tributary of the Soengai Siak. They show traces of Negrito origin and appear to be akin to the Semang of Malaya. They are said to have no idea of property except in the amulets worn by the women. They live on rafts moored to the shore, or in shelters along the beach. The main diet is fish caught with fish poisons, but they also hunt, using blowpipes. They are gradually dying out and women are so scarce that the men seek mates among their neighbours, the Sakai.

Another distinct group is formed by the Orang Laoet or sea-gypsies, scattered along the coast from Burma to Borneo, but especially numerous in the Riouw archipelago. So long as the weather allows they live at sea in boats, together with their dogs and fowls, but during the stormy season, they build shelters along the shore and live on shellfish. Some have settled permanently in the Inderagiri district and on the adjacent islands and cultivate plantations of coconut; many of these are Muslim in name.

The other primitive peoples fall into three groups, one on the east coast, one in the interior and one in the islands off the west coast.

The tribes along the east coast are the Sakai, Talang, Oetan, and Rawar. The Sakai live on the Soengai Mandau and many of them are nominally Muslim. Their social organization is based on the matrilineal family with observances resembling those of the Menangkabau. The main occupations are hunting and fishing, and their chief weapon the blowpipe, in which they use poisoned darts. The Oetan and Rawar live on the islands off the coast, and the Talang, rather less primitive, live further up the Soengai Mandau.

The tribes of the interior comprise the Orang Mamak, the Koeboe and the Loeboe. The Orang Mamak, who live in the Inderagiri district, seem to be a progressive branch of the Sakai that has taken to agriculture. They are divided into exogamic clans; husband and wife ordinarily remain with their respective clan. When the man dies the clan is responsible for his debts, but on the death of the mother the responsibility for her debts passes to the children. There are clan and family headmen, and these offices descend in the female line. The chief occupation is the cultivation of rice in temporary clearings. The Koeboe in the swamps of Djambi are more primitive and were still nomadic at the beginning of the present century. They have been described as lacking any social organization, but it seems that there are five sibs or family groups. The only marriage ceremony is the public announcement of mutual consent. Their shelter is a mere hut, a low platform without walls and with a roof of leaves. Their scanty costume consists of a piece of *tapa* cloth rolled up round the loins, though some are taking to Malay costume. They practice neither circumcision nor incision. They are ignorant of agriculture, as shy as wild animals, and so afraid of water that they never wash. Though able to make fire by rubbing sticks together, they used to eat their food raw but now cook their rice; a bamboo cooker is their sole utensil. They have no musical instruments and do not dance.

The Loeboe of the Tapanoeli and Westkust Residencies are in name Muslim. They are patrilineal and the men pay a bride price. Formerly they lived in shelters built in trees. They live chiefly by hunting with blowpipes, knife and bow, but some have taken to cultivation in the plains.

The peoples of Mentawai, Nias and Enggano, are very mixed. In Mentawai the culture indicates Polynesian affinities. The religion is a veneration and dread of numerous spirits, combined with fetishism; they have spirit houses in the forest, rough shelters in which a bamboo cylinder is decorated with rags, leaves and flowers. The villages consist of several small hamlets each under its own leader and the houses are built on piles. Some families live alone, but fifty may occupy a single dwelling, and there is a bachelors' house for the young men. The costume is a loin cloth, and primitive garments of leaves are still worn by some; the bodies of both men and women are extensively tattooed. The males are incised by splitting the prepuce. The girls have their teeth filed and blackened before marriage, and the teeth of the men are also filed. The chief occupations are fishing and hunting, but there is some agriculture, mainly root

crops being grown; sago is their principal food. They have canoes and sailing boats with double outriggers.

In Nias the people of the north and south differ considerably. Ancestor worship prevails, and the skulls of the deceased are preserved as fetish objects. Until recently head-hunting was common and human sacrifices were offered at the burial of a chief. Megalithic monuments are numerous and are still erected; they are especially characteristic of the south where the villages are surrounded by stone walls. There are communal meeting places paved with stones and stone steps lead up to the higher villages. In the north the family is patrilineal and the man pays a bride price; in the south matriliney obtains. The usual clothing is a loin cloth formerly of bark-cloth, or a short skirt for the women, but in the south under missionary influence the Malay costume is spreading. The teeth are filed and formerly they were also blackened. The boys are subjected to incision at puberty. Some rice is cultivated, but agriculture is at a low level; yams are generally grown and, in some places, taro and maize. Hunting and fishing are important occupations. The indigenous peoples do not use boats. Work in stone, wood and metal shows a keen artistic sense. Among the pastimes are kite-flying and a form of football with a cane ball that is kept in the air as long as possible.

The people of Enggano resemble the Loeboe and Koeboe. Until the present century they were wholly naked, and dwelt in houses resembling beehives perched on poles. They have a crude form of canoe with double outriggers. Many have now accepted Christianity.

PEOPLES OF BORNEO

All round the coast of Borneo the people are descended largely from immigrants who have settled there in comparatively recent times: Malays from Sumatra and the Riouw archipelago, especially in the west and south-west; Boeginese, especially in the south-east; Javanese, who have mixed with Malays to form the Bandjarese of south Borneo; and Chinese, especially in Sambas, Mampawah and Pontianak on the west coast. All these immigrants have penetrated the interior along the great rivers and have intermarried with the indigenous inhabitants. Natives who have accepted Islam and adopted the culture of the immigrants are known generally as Malays; the remainder are comprehended under the general term Dyak, which signifies 'highlander' or 'inlander' and covers a medley of tribes

widely different in culture. In central Borneo the leading tribes are the Kajan, Kenja and Bahau; in the south and east the numerous tribes are grouped together as Oeloe Ngadjoe, among whom the best known are the Ot-Danoem; the chief tribe in west Borneo is the Oeloe Air. Scattered among these are nomad tribes, such as the Poenan, who are also sometimes reckoned among the Dyak.

Dyak

The Dyak religion consists generally of a belief in tutelary powers and in non-human ancestors. Some kinds of food are taboo. These features suggest totemism but this explanation has not found general acceptance. Coupled with this belief is a trust in the magic power of fetishes and in the validity of omens. The priests, who are both male and female, are consulted regarding agricultural operations and on other ceremonial occasions, and in times of doubt or distress. Head-hunting was formerly common; the object seems to have been to gain possession of the powers of the man whose head was taken, but the custom was not purely religious and was associated with tribal quarrels.

Social relations are based on the family and not on the village. Among some tribes patriliney prevails, but the children inherit equally from both parents. Marriage is endogamic and usually monogamous. The woman has ordinarily the same rights as a man and among some Kajan the woman may be the head of an independent family group. The village consists of one or more long houses, built on piles; they may be five hundred feet or more in length, and accommodate some five hundred people. Among some tribes the whole family group dwells in a single house, with a special apartment in the middle for the head of the family, and a verandah for council meetings, used also as a resthouse for strangers. In some form the long house survives almost everywhere.

The dress ranges from a loin cloth to the dapper outfit of an up-to-date Malay. Tattooing is general, and the teeth are usually filed. Some of the backward tribes insert in the penis small knobbed bars or rings which are removable when not in use. Three classes of property are recognized: individual property, such as clothing, ornaments and weapons; property jointly acquired by a married couple during cohabitation; and property held in common by the family group. Cultivation is general, but of a low grade and mostly shifting; embanked land is found only near the coast. The food is rice, supplemented by maize and root crops, with fish and vegetables.

More Primitive Tribes

Among primitive tribes the Poenan are the best known. In social organization and customs they resemble the primitive tribes of Sumatra. Other similar tribes are the Boekit and Beket in the north, and the Olo-ot and Basep in the south and east.

PEOPLES OF CELEBES

The peoples of Celebes fall into three main groups; those of Makassar and the Boeginese in the south; those of the Minahasa region in the north-east; and the Toradja in the remainder of the island.

Peoples of Makassar and the Boeginese

The peoples of Makassar and the Boeginese (often known as Mandarese) are very much alike; the former occupy a wide tract round the town from which they take their name, and the latter occupy the rest of the southern peninsula and also have many settlements along the coast and in other parts of the archipelago. Both profess Islam, but have strong belief also in spirits of a non-Islamic kind, and the heathen priests, both male and female, have much influence. In the social organization three classes are recognized—nobles, commoners and slaves, though slavery is no longer permitted. Society is built up on the family, and both patrilineal and matrilineal principles of organization are found. In some parts it is the custom for married couples to live with the relatives of the husband; in others they live with the relatives of the wife. In most respects men and women are equal; both retain their separate property on marriage; women can act independently in business and some of the chieftains are women. Among the Boeginese the odd-numbered children belong to the mother and the even-numbered to the father; they inherit from the parent to whom they belong. Divorce is common and is easily obtained by either party.

The villages usually contain about thirty houses, made of bamboo and standing on piles. The men wear short trousers with a *sarong* over the shoulders, now often replaced by a jacket; the women wear a *sarong* and jacket. Both sexes are fond of bright colours, blue, green and especially red. Agriculture does not reach a high level; cultivated land is held in individual possession, subject to the requirements of the village, while waste land is held in common by the village. Many families live by hunting or fishing. The crafts comprise weaving, metal work and ship-building. The Boeginese have long been famous

as traders and navigators. There is a considerable literature in a script of Indian origin.

Toradja

The Toradja comprise numerous petty tribes. The name (*to*=man, *radja*=upland) was originally given by the Boeginese to their subjects in central Celebes, but has been adopted by Europeans to denote all inland peoples resembling these in speech or culture. The tribes distinguish themselves by prefixing *to* to the name of the river along which they dwell. Three main groups may be recognized: the Poso in the east; the Sigi and allied tribes in the north-west, and the Sadan in the south-west. These are much alike in culture, differing mainly in speech. The Toradja respect and fear ancestral and local spirits. Head-hunting was general until suppressed during the present century. Worship of the dead is a main factor in the religion of the Toradja. The corpses are placed on a platform until the flesh has decayed, when a feast is held and the bones are collected with much ceremony and placed in grottoes or, with some tribes, in niches hewn out of the rock. Among the Toradja of the south and west megaliths are erected to the memory of the dead. During the last fifty years many have adopted Christianity, especially among the Poso.

There is little distinction of classes, especially since the liberation of the slaves in 1906. The social organization is based primarily on kinship. Marriage is endogamous. The man is head of the family, but usually lives for some time with his wife's relations. The women enjoy considerable freedom. Formerly the villages were built high in the mountains in places difficult of access and were often fortified with earthen walls or bamboo palisades, but the Dutch government has tried to settle the people in the valleys in villages with houses in rows and each standing in its own compound. The houses are large buildings on massive piles, and are curiously decorated (Plate 19). Each contains four to six families in separate compartments round a central room with a common hearth. Formerly the dress consisted of a loin cloth of bark, but the Malay costume is spreading. The teeth are filed and the front teeth often extracted. The staple food is rice where this is obtainable, but the people of the more remote villages live chiefly on maize. Cultivation is mostly shifting, permanent embanked land being found only in some valleys. Cattle-breeding, fishing and hunting are important, and so also is the collection of forest produce.

Peoples of the Minahasa Region

The peoples of the Minahasa region present many features of interest. Practically all have adopted Christianity. The nobles still form a class apart from the common people. The social organization was formerly based on kinship, but has now largely given place to a territorial organization based on villages. With Christianity the people have adopted European clothes and manners, and the Minahasa region is often termed the 'Twelfth Province' of the Netherlands. Each village has its church and school, and both men and women are highly educated; many find clerical employment in Java and there is a strong contingent in the army. West of the Minahasa region numerous tribes show a gradual transition to Toradja culture.

In secluded tracts among the hills primitive people still survive. Among these are the Toäla, who until quite recently dwelt in caves and lived by hunting; they had no domestic animal, except the dog. Now they are taking to agriculture.

PEOPLES OF THE MOLUCCAS

The Moluccas comprise innumerable islands which may be arranged geographically in three groups: the northern group including Halmahera, Ternate and Tidore; the central group with Ceram, Boeroe, and Amboina; and the southern group including the Banda, Kai, Aroe and Tanimbar islands. The islands are small, their coasts have long been settled by immigrants and the peoples are very mixed; much of the information regarding their culture dates from before the rise of exact ethnological research.

The coastal peoples, whether deriving from Java, Celebes or Sumatra, are generally known as Malays, and this term comprises also indigenous peoples who have adopted Islam. The peoples of the interior are comprehended generally under the name Alfoer which, however, signifies no more than 'Inlander'. Christianity is the chief religion in the south of Amboina and has made great progress in Boeroe and Ceram; there are Christian groups in many of the other islands. Apart from Christians and Muslims, the people in general venerate and fear ancestral and local spirits; head-hunting persisted until stopped by the Dutch. In contrast with Borneo and Celebes true totemism is found; it is strong in Tanimbar and traces exist from Halmahera to Ceram and Amboina. People holding this belief regard

themselves as descended from certain animals or plants which they refuse to eat or even to look at. Associated with totemism is a grouping of the people into age-classes, although it is only in Tanimbar that this persists with any strictness. In Tanimbar and Kai a megalithic culture is found; in the former the stones are grouped in the shape of a canoe with small upright stones for the chieftains, a large flat stone for the people and a large sacrificial stone.

Except in Amboina and the Oeliassers, the social organization is built on the family group; in some parts the larger kinship units are matrilineal, but in general they are patrilineal. Marriage, except where matriliney exists, is exogamic. Polygamy is unusual. The villages of the interior are usually small groups of some half dozen houses, and there is a communal house which is sometimes a dwelling for spirits, sometimes a sleeping place for bachelors, and sometimes a resthouse for strangers, or it may serve for village feasts. The houses are often no more than shelters made of cane and leaves. The dress consists of a loin cloth and headgear. The teeth are filed and circumcision is practised. The staple food is sago, which needs little or no cultivation, and the chief occupations are hunting and fishing. The principal festivity is the war dance (*tjakalélé*), performed on ceremonial occasions by the warriors in full dress which is often reminiscent of old Portuguese costumes. In Amboina there is a national dance (*menari*) performed by girls.

PEOPLES OF NEW GUINEA

The greater part of Dutch New Guinea has not yet been brought under effective administration and, although some expeditions have been accompanied by ethnologists, much still remains to be learned about the numerous petty tribes with which the country is thinly populated. Three levels of culture are recognized. Along the west and north-west coast the culture is largely Indonesian, allied to that of Ceram in the west and to that of Ternate in the north-west. Along the north-east coast it is coloured by that of Melanesia. In the interior the cultures are Papuan. The religion includes a belief in good and bad spirits, and is characterized by numerous feasts at marriages and funerals. In some villages there is a spirit house (*mau*), larger than the ordinary hut, and often used for feasts and ceremonies, and sometimes as a sleeping place for bachelors. Head-hunting has not yet been wholly suppressed. Totemism is general, and the various tribes regard

themselves as descended from some animal or plant which they refuse to eat and avoid looking at.

The tribes are loosely organized and in many parts no authority above the head of the family is recognized. One feature of their social organization is a division into age-classes, through which each member graduates from childhood to old age. Some go naked, while others wear a loin cloth of bark. There is a general fondness for ornaments, and decoration of the body with garlands of flowers. These tribes have not yet learned to tap the sago palm for wine, and water is their only drink; their food consists largely of sago and fish. The chief occupations are hunting and fishing, though there is a little cultivation of root crops. Stone implements are still used, but are gradually being replaced by imported metal tools.

PEOPLES OF BALI AND LOMBOK

The population of Bali is mainly Balinese, a people who by general consent are of peculiar charm. They claim descent from Javanese who at various times have sought refuge from Muslim persecution. The religion is a form of Hinduism, with some Buddhist elements, and permeated by primitive superstitions. Of the three chief Hindu gods, Siva is the object of special devotion, and Vishnu and Krishna are regarded as aspects of Siva rather than as separate gods. The four castes of orthodox Hinduism are recognized, but there is no relation between caste and livelihood and the sudras, constituting the lowest caste, are under no special disabilities. Temples are numerous, usually ornate and often impressive. Under native rule the island was divided between several petty rajas; society is still aristocratic, but the social organization is based upon the territorial village. In some villages, however, a kinship organization is important and membership of the village council is confined to descendants of the original founder. Marriage is prohibited between close relations, including 'spiritual relations', as, for example, the daughters of the man's priest or teacher. Men, but not women, may marry with a member of a lower caste. Four forms of marriage are recognized. By convention the father of the man is supposed to arrange the marriage but elopement, with the tacit approval of the elders, is usual. The woman goes with the man, who is the head of the household. The status of women is formally lower than in most parts of the archipelago, but in practice they exercise much influence and enjoy



Plate 20. The *Baris Dadap*, a Balinese dance



Plate 21. The *Rangda* or witch-widows in Balinese dance

The climax of the dance in which the *Rangda* take part is a fight between them and the *Barong Keket*, from which the latter, as protector of the villagers, comes out victorious.



Plate 22. *Barong Keket*, mythical monster in Balinese dance
The mask held by the dancer is of polished scarlet wood, with protruding eyes and tusked jaws, its ears being framed in a winged tiara of perforated leather. From the chin there hangs a black beard of human hair, in which the essence of the monster's power resides.

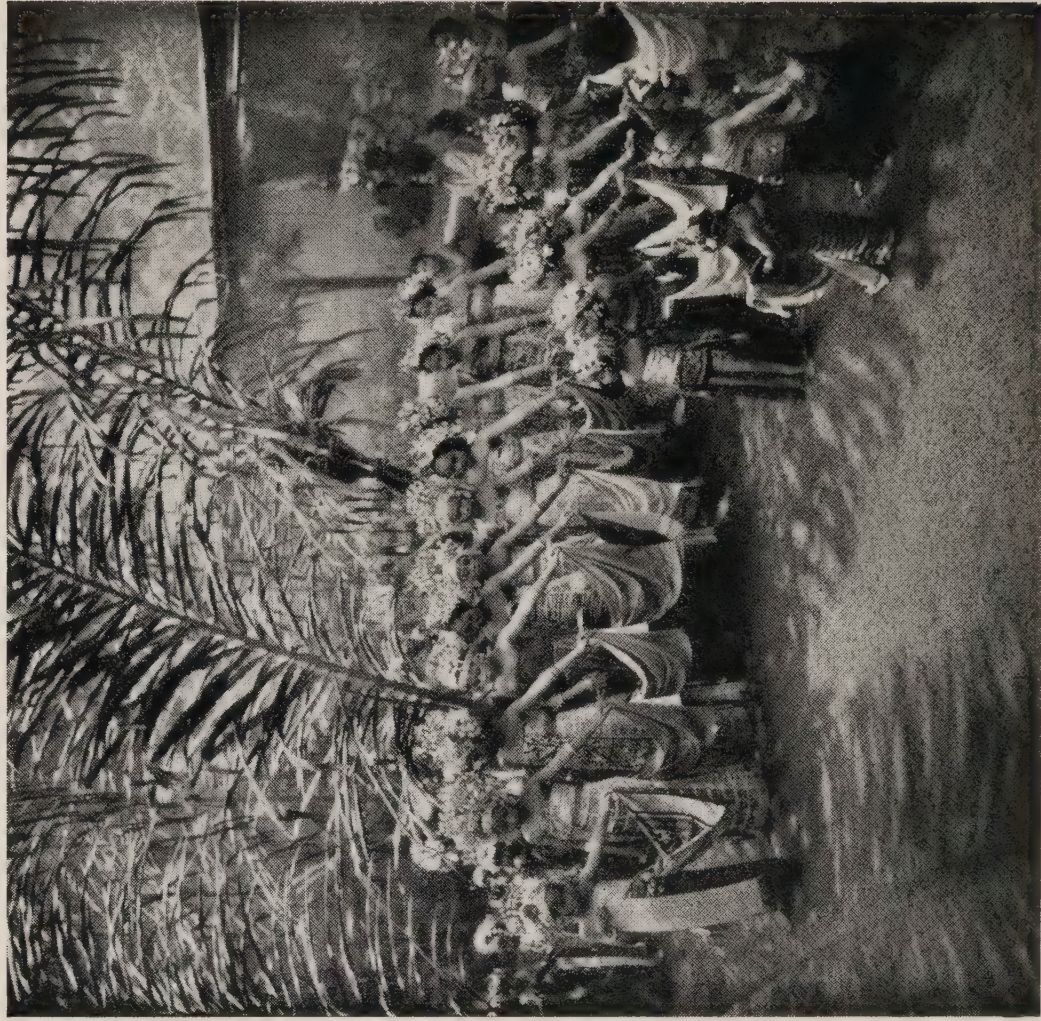


Plate 23. The *Redjang*, a Balinese dance

considerable freedom. Polygamy is not uncommon among the wealthier classes. Until prohibited by the Dutch during the present century *sati*, the burning of widows at the funeral of the husband, was practised by those who could afford the costly ceremonies that it entailed. Cremation is the orthodox method of disposal of the dead, but it involves much expense and burial is more common.

The villages are large, and the houses, built on piles and usually of clay, are arranged symmetrically, parallel and at right angles to a broad road running north and south. In the centre of the village is a large banyan tree, shading a vacant plot used for village meetings, entertainments and a market. In the larger villages there is a separate assembly hall (*balé agoeng*), a watch tower, a bazaar and a shed for cockfighting, though this sport is now prohibited. The cemetery and bathing place are usually on the south side of the village. The dress of the men resembles that of the Javanese, but the women customarily go nude above the waist, though this is no longer fashionable. Both sexes are fond of bright colours. Pork is a favourite article of diet, and palm wine and opium are freely used. The Balinese are excellent cultivators and are expert in irrigation; they pay great attention to the breeding of cattle and pigs. Petty trade is mostly conducted by the women. Arts and crafts reach a high level, and a strong artistic sense is evident in the metal and wood work and in the decoration of the temples; fine pottery is also manufactured. Their music, dancing and drama enjoy wide repute, and they have an extensive literature, mostly poetic, in a script of Indian origin.

Dancing plays a great part in the life of the Balinese. All the dancing is religious in the sense that it is connected with the temple rites in varying degrees, and, like the dancing of the Javanese, cannot be compared with European dancing for amusement.

All the temple feasts are accompanied by dances which are essentially ceremonial and generally slow moving. Among the best known of these are *Redjang*, a dream-like dance of smooth, unending motion, and *Baris* (Plates 20, 23). The *Baris* is the most splendid of Balinese dances and culminates in a mock battle in most forms, though certain *Baris*, such as the *Baris Kekoepoe*, are purely decorative dances performed by children. Certain dances, *Sanghyang* and *Ketjak*, are performed by dancers in a state of trance. The former is generally danced by small girls, or occasionally by boys or priests, while the latter is well known under the name of the 'monkey dance' to every tourist who visits Bali.

The method of inducing the trance consists essentially of holding

the heads of the dancers over the smoke of incense while a melody is sung by men or women sitting round the dancers. The tempo is at first very slow but becomes quicker and quicker as the moment of falling into the trance approaches. The *Ketjak* is a recent development from the *Sanghyang* under the influence of a great *Baris* dancer, Limbak. Like most Balinese dances it portrays a story from the Sanskrit epics, in this case the *Ramayana*; the performance is of an ecstatic ritual character and produces a great impression on the spectator.

The Balinese lives in constant fear of evil spirits, which cause disease and misfortune, and so has many dances whose purpose is to exorcise them. A large group of these dances is called *Barong*, from a mythical monster which plays a part in all of them. It consists of a long sagging body built on a framework of bamboo and string covered with various kinds of material and wearing the masks of different animals such as the tiger, wild boar or elephant (Plate 22). The *Barong* is animated by two men, one forming the front, the other the hind legs. The other main character in the *Barong* dance is the *Rangda*, the witch-widow (Plate 21) and the climax of the dance is a fight between these two in which the *Barong*, the protector of the villagers, eventually defeats the *Rangda*. The conflict is viewed with such intense emotion that a state of trance is induced in the dancers, the village mediums (kris-dancers) and in members of the audience. At a moment in the fight when the victory of the *Barong* seems doubtful the 'kris-dancers' rush to his assistance and attack the witch. Her power is such that they turn their kris on themselves and sometimes inflict wounds.

The *Barong* type of dance exists in many variants some of which emphasize the dramatic element which is in all Balinese dances, to such an extent that they may be regarded as dramas. Similarly there are dramatic *Baris* and the *Wajang Wong*. The latter is like the *Wajang* of Java, but it is acted by people who wear the mask of the character they represent instead of by puppets whose shadow on a screen is all that the spectator sees.

The Sasak, the chief people of Lombok, are nominally Muslim, but are very lax in their observances and one large sect allows the use of pork and strong liquor. Their houses are built on stone mounds and not on piles. The chief occupation is agriculture. Balinese influence is apparent in most aspects of their life, but culturally they are on a far lower level.

Two small tribes, the Bali-Aga, mostly in Bali, and the Bodha in

Lombok, apparently represent the earlier inhabitants of these islands. Although still very backward, their beliefs and customs have taken colour from those of the more civilized peoples by whom they are surrounded.

PEOPLES OF THE TIMOR GROUP

The islands from Lombok to Timor show a transition from Indonesian to Papuan grades of culture. The coastal peoples have a Malay element and are in general Muslim. The peoples of the interior are mostly pagan, but Christianity has made some progress locally, especially in east Flores. Megalithic remains, associated with sacrificial practices, are found in most of the islands and megalithic work is still carried on in Soembawa, Soemba, Flores, the Alor and Solor islands, Timor and Wetar. Modern megalithic art reaches a higher level in Flores than in any other place except Nias. Shamanism seems to be unknown. Totemism is found in Flores and the Alor and Solor islands, and plays an important part in the religious and social structure in most of the Flores-Timor zone. Descent is usually patrilineal. In some districts the sibs are grouped for marriage into age-classes, much along the lines obtaining among Papuans. Agriculture, though generally practised, is on a low level, and the chief crop is maize; the breeding of horses receives great attention, especially in Soemba and Timor.

EDUCATION

Elementary schooling in the Netherlands Indies is given in Dutch, in the various vernaculars and in Chinese, while higher education, except for vocational training, is mainly in Dutch. In 1939 there were 942 schools in which teaching was in Dutch, and 20,498 schools in which teaching was in the vernacular. These had 183,294 pupils and 2,141,311 pupils respectively. There were also 18 Chinese schools with 2,265 pupils and 57 Dutch-Chinese schools with 24,800 pupils. The schools are maintained by the government, by local bodies, and by non-official organizations. Most of the private schools are religious foundations managed by missionaries. There have long been mission schools in the Outer Provinces, but in Java, for fear of offending Muslim feeling, the missions were not allowed to open schools until the last half of the nineteenth century. It was not until nearly the end of the century that they received grants from the government, but since then they have been subsidized on condition

of satisfying the government requirements. Private schools have been maintained by the Chinese since about the beginning of the present century, and by the natives, especially during recent years, as one aspect of the nationalist movement. These schools also receive grants if they comply with the conditions laid down by the government.

One distinctive character of society in the Netherlands Indies is the large number of people recognized as Europeans, and therefore in need of schools suitable for Europeans. These have been provided by the government since the restoration of Dutch rule in 1816. At the end of the last century two-thirds of the modest expenditure on education was appropriated to European schools and, although native education has now come into the foreground, the demands of European parents, whose children spend part of their school life in the East and part in Europe, still determine the standard of general instruction, and raise it to a higher level than in many other tropical dependencies. Until 1848 the government made no provision for the instruction of natives, though a few of the better class were allowed to attend European schools. From that year schools were opened for natives, but the course of instruction was distinct from the course for Europeans, and aimed primarily at turning out subordinate employees for public and private business. In 1907 a first attempt was made to introduce general primary instruction by the opening of village schools, and since then the course of native instruction has been brought into conformity and linked up with the course for Europeans, so that the demand of European parents for a high standard of instruction is reflected throughout the whole field of education. The educational system as it exists to-day is a complex organization aiming to serve all classes and all types of people in the Netherlands Indies.

European Schools

For Europeans from six to sixteen there are European Lower Schools. There are seven classes and the children should ordinarily spend a year in each class. The course is generally similar to that in the corresponding schools in the Netherlands, so that children, when their parents are on furlough, can be transferred to the corresponding class at home. Under certain conditions non-Europeans are admitted to these schools. On passing out of the Lower School the pupil may go to a European Middle School. These are of two main types: Secondary Schools (*Hoogere Burger Scholen*—known as H.B.S.),

with a modern curriculum; and Grammar Schools (*Lycea*) with a classical curriculum. Some of the H.B.S. have a three-year course and others a five-year course; in the *Lycea* the course lasts six years. The curriculum in these schools is identical with that in corresponding schools in the Netherlands so that, not only may the student transfer from one to the other but, on successful completion of the full course, he is qualified to enter a university either in the East or at home.

Native Schools

For natives primary instruction is in general provided in the village schools, which are maintained by the village with financial support from local funds or, if local funds are inadequate, from the government. Ordinarily the building is provided by the village, and the teacher paid from local funds; the pupils are supposed to pay fees, but these are usually remitted, lest parents should be discouraged from sending their children. The schools are supervised by the Regents in Java and by the Subdivisional Officers in the Outer Provinces. There are three standards and the curriculum comprises reading and writing vernacular in the native and Latin script, elementary arithmetic and general knowledge.

Some schools, mainly in the towns, carry native instruction a stage further. These were formerly known as Standard or Second Class Native Schools, but are now termed Complete (*volledige*) Schools. The ordinary course lasts five years, but a sixth year is sometimes added to give instruction in agricultural or domestic science. Although the medium of instruction is the vernacular, Dutch has been introduced as one of the subjects in the higher classes since 1932. Ordinarily, however, instruction above the third standard is given in separate schools without the three lowest classes, known as Continuation Schools, which specialize in giving extended lower instruction. The Chinese are freely admitted to these native schools, but they also have primary schools of their own, where the medium of instruction is Chinese.

From these vernacular native schools the pupils can pass on to receive vocational instruction in the vernacular. Since 1937, it has been made possible for children to continue their general education in the vernacular with 'more extended lower instruction' (*Meer Uitegebreid Lagere Onderwijs*—known as 'Mulo') in Vernacular Mulo Schools, with a three years' course.

In all the other schools the medium of instruction is Dutch, and

they are professedly based on Western models. For obvious reasons it is impossible to arrange courses in the vernacular parallel with those in Dutch, but it has been thought desirable that gifted children from these schools should have a chance to profit by higher Western instruction. Schools have therefore been provided which admit promising children who have passed the Third Vernacular Standard, and train them for further instruction in Dutch. These schools link up the Vernacular with the Western schools and, from the nature of their function, are known as Link Schools. The medium of instruction is mainly Dutch. The course lasts five years and carries the pupil to the same stage as the Dutch-Vernacular Lower School.

The Dutch-Vernacular Lower Schools are intended for native children of the better class. They have developed out of the former First-Class Schools, which were re-organized in 1911 so as to be on the same level as the European Lower Schools. The course lasts seven years and is very similar to that in the corresponding European schools, but includes the local vernacular and Malay. There are a few Special Schools with much the same course, but of older standing and catering particularly for Native Christians. The Dutch-Chinese Lower Schools provide a similar course for Chinese pupils. About the beginning of the present century, the Chinese, under nationalist influences and dissatisfied with the provision then made for their instruction, began to found their own schools, where English, as the medium of commerce, was preferred to Dutch. It was with a view to countering this separatist tendency that the government provided Dutch-Chinese schools, and this concession led the natives, under nationalist influences, to demand Dutch-Vernacular Schools.

From the Link Schools, the Dutch-Vernacular, Special and Dutch-Chinese Schools, the pupil may proceed to 'more extended lower instruction' in the Western Mulo Schools. These schools serve partly as 'finishing' schools, and are therefore attended also by some pupils from European Lower Schools who do not intend to continue their studies to a higher stage. But they serve also as preparatory schools for a complete secondary education. From the second year, therefore, the course branches out according to the further requirements of the pupils. The full normal course lasts three years, but there is a preliminary class for pupils who are handicapped by not speaking Dutch as their native language.

From the Mulo school the pupil may go on to the General Middle School, a secondary school corresponding to the three highest classes of the H.B.S. There are three branches to the curriculum: Oriental

Letters; Western Letters; Natural Science. In both the literary faculties the curriculum includes Dutch, French, English, German, General History and Geography, Civics, Political Economy, Elementary Science, Drawing and Physical Training; the Oriental branch further includes Javanese, Malay, and the History of Indonesian Culture and Art, and the Western branch includes Latin and the History of Ancient Culture. In the scientific branch the course is the same as in the three highest classes of the H.B.S., except that a vernacular is substituted for French.

Vocational Schools

Vocational instruction is available both on the basis of a native schooling, usually in the vernacular, and on the basis of a Western schooling, in Dutch. The following summary shows the provision made for vocational training:

(i) *Industrial Training:*

Native: Trade courses for two and three years in carpentry, furniture-making, and smithery; 11 Government, 14 Municipal and 12 Regency Schools, some with a Dutch division.

Western: Trade Schools, with three years' course, to train poor Europeans with a Lower School certificate, for such posts as foremen and engine drivers.

Two Technical Schools (Queen Wilhelmina at Batavia, Queen Emma at Soerabaja), also one Private (Semarang) with a five year course in mechanical and electrical engineering; open to all classes with the required certificate.

(ii) *Domestic Economy:*

Native: in Girls' Continuation Schools.

Western: 4 Government and 9 Private Schools, and also Private one-year courses.

(iii) *Commercial Training:*

Native: 14 schools, training for retail trade, linked up with Continuation Schools.

Western: 2 Night-Schools; 3 Lower Commercial Schools, and 1 Mulo Commercial School, corresponding to 3 years H.B.S.

(iv) *Training of Teachers:*

Many schools, both vernacular and Western.

(v) *Medicine:*

Native: Schools for medical subordinates and nurses.

Western: NIAS (*Nederlandsch-Indisch artsenschool*) to train as medical subordinates, men and women who have passed through the Mulo or 3 year H.B.S. This replaced in 1933 the STOVIA (*School ter opleiding van Indische artsen*). For dentists (*tandartsen*) there is the STOVIT (*School ter opleiding van Indische tandartsen*).

(vi) *Administration:*

Western: Schools for the native civil service, with a three-years Mulo course. These are known as MOSVIA (*middelbaar opleiding school voor indische ambtenaren*). There are also numerous courses and schools maintained by the various departments and services for the training of their subordinates.

Higher Education

Higher education of the university standard was formerly available only in the Netherlands. But in 1920 some leaders of private enterprise opened a Technical High School in Bandoeng, which was taken over by the government in 1924. The course lasts five years and corresponds to that given in Dutch technical colleges of university standing. In 1924 a Law High School was opened and in 1927 a Medical High School. In 1938 there was added a faculty of administration, the *bestuursakademie*, with a three-year course for native officers of the civil service. Since the occupation of the Netherlands in 1940, further courses have been added in arts and natural science, largely to meet the demand of students who could no longer proceed to Europe, and in part to meet the new demand for scientists in the rapidly developing local industries. The whole complex of high schools and courses under these various heads has now been co-ordinated as a University, but without any centralized buildings.

Libraries

A notable feature of the educational system in the Netherlands Indies is the Bureau for Popular Reading. This publishes periodicals and books in the vernaculars, and makes provision for translation and adaptation of European books. The object is to supply reading matter for natives who might otherwise forget what they had learned at school. The books are sold or lent out through libraries. The libraries, which contain books both in European languages and in the vernacular, are usually placed in the local school. Any one is entitled

to borrow a book on payment of a very small fee, which goes to the school-teacher as librarian. Thanks to the care and zeal with which this plan has been applied, it has achieved a very remarkable success.

BIBLIOGRAPHICAL NOTE

1. An account of the legal classification of the peoples is given by P. Kleintjes, *Staatsinstellingen van Nederlandsch-Indië* ('s Gravenhage, 1931).
2. Physical types and culture are described in numerous works among which may be mentioned the following: J. J. Kleinweg de Zwaan, *The Anthropology of the Indian Archipelago* (Weltevreden, 1929); B. Schrieke, *The Effect of Western influence on native civilization in the Malay Archipelago* (Batavia, 1929); C. van Vollenhoven, *Het Adatrecht van Nederlandsch-Indië* (1906-31); B. A. G. Vroklage, *Die soziale Verhältnisse Indonesiens* (Münster, 1936).
3. The peoples and customs of particular islands are described in the following works: B. J. H. Nijssen, *The Races of Java* (Weltevreden, 1929); N. J. Krom, *Hindoe-Javaansche Geschiedenis* (s' Gravenhage, 1931); M. Covarrubias, *Island of Bali* (London, 1937); Beryl de Zoete and W. Spies, *Dance and Drama in Bali* (London, 1938); C. Snouck Hurgronje, *The Achehnese*, in two volumes translated by A. W. S. O'Sullivan (Leyden, 1906); C. Hose and W. McDougall, *The Pagan Tribes of Borneo* (London, 1912).
4. An account of the progress of education is given in Raden Loekman Djajadinigrat, *From Illiteracy to University* (New York, 1942), in I. Brugmans, *Geschiedenis van het onderwijs in Nederlandsch-Indië* (Batavia, 1938) and in Hollandsch-Inlandsch Onderwijs-Commissie, *Résumé* and *Eindrapport* (Weltevreden, 1930-31).
6. There are in addition many articles in various periodicals, among which may be mentioned *Tijdschrift voor Indische Taal-, Land-, en Volkenkunde* and *Bijdragen tot de Taal-, Land, en Volkenkunde van Nederlandsch-Indië* (Batavia) and *Koloniaal Tijdschrift* ('s Gravenhage).

Chapter II

HISTORICAL OUTLINE BEFORE 1800

Introduction: Indian influence from the second century to the eighth century A.D.: The Sailendra Dynasty, A.D. 750-850: The Kingdom of Mataram, A.D. 850-1007: The Kediri, Janggala and Singhasari Kingdoms and the Decline of Sri-vijaya, 1007-1292: The Kingdom of Majapahit, 1292-1500: The Expansion of Islam, 1292-1500: The Portuguese in the East Indies, 1500-1600: European Commercial Rivalry in the East Indies, 1600-84: The Rise of Dutch Power in Java, 1600-84: The Consolidation of Dutch Power in Java, 1684-1780: The Growth of Dutch Rule in the Outer Provinces, 1600-1800: Administrative Organization under the Dutch East India Company: Dissolution of the Dutch East India Company, 1798: Bibliographical Note

INTRODUCTION

The guiding threads to the history of the East Indies up to the arrival of the Europeans in the early sixteenth century are, firstly, the struggle for political and commercial supremacy between Java and Sumatra and, secondly, the assimilation of Indian culture and religion. The lands bordering the Malacca strait were marked out by nature for the seat of a commercial empire, as they dominated the shortest sea route between the East and the West. In agricultural resources, however, these lands were far inferior to Java, which had the further advantage of a central position favouring political and commercial control over the archipelago. As trading vessels could avoid the exactions of revenue officers in the Malacca strait by taking a course through Soenda strait, the dominating power in Sumatra always sought to close these straits, whereas it was in the interests of Java to keep them open. After periods of fluctuating fortune, Java, in the eleventh and fourteenth centuries, gained the ascendancy in the struggle for power. It has maintained this dominant position to the present day.

The assimilation of Indian culture was a marked feature of the early history of the East Indies. At various points along the coasts the Indians founded colonies which later grew into petty kingdoms. Among the early colonists, Hinduism, possibly with a special cult of Vishnu, prevailed; then from the fifth to the eighth centuries there was a wave of Hinayanist Buddhism which later yielded place to Mahayanism and finally to Sivaism. Hinduism in its Sivaite form

was the chief religion in Java until it finally succumbed to Islam about the beginning of the sixteenth century.* The foundation of colonies lasted, possibly with long breaks, up to the eighth century and during this period the settlers intermarried with the indigenous peoples. In Java a dual society, comprising both Indian and native elements, was gradually transformed into a more or less unitary society in which both were blended; the Indian, Indo-Javanese and Javanese periods can be distinguished. In many parts of the archipelago, however, the Indians were traders rather than settlers and their influence was relatively slight, though all along the coasts it has left a permanent imprint on the social organization in the form of a territorial aristocracy outside and above the family stem.

The arrival of European traders and adventurers in the early sixteenth century marked a new and important stage in the history of the East Indian archipelago. Rival trading stations were established by the Portuguese, Spanish, Dutch, French and English principally with a view to gaining a monopoly in the spice trade. After a long and bitter struggle the Dutch succeeded in driving their rivals out of the archipelago and at the same time either destroyed or reduced to subservience most of the petty native kingdoms.

INDIAN INFLUENCE FROM THE SECOND CENTURY TO THE EIGHTH CENTURY A.D.

For seven hundred years immigrants from India settled in and traded with the lands of south-east Asia and they had a deep and lasting cultural influence upon the peoples with whom they mixed. The earliest Indian settlements of more than local importance were situated outside the limits of the East Indian archipelago in Champa (the southern part of modern Annam) known to the Chinese as Lin-I and in Kamboja (the modern Cambodia and Cochin-China), known to the Chinese as Fu-nan. Both were commercial powers and in both the state religion was Hindu. During the third century A.D. the ruler of Fu-nan took the title of 'Great King' and extended his rule over the archipelago. Such epigraphic and archæological evidence as is available supports the picture given by the Chinese historians of the archipelago as a sphere of Hindu influence with its centre in Cambodia. Hinayanist Buddhism, however, had already reached

* For a brief account of the main tenets of Hinduism, Buddhism and Islam see Appendix I.

Siam and from about the beginning of the fifth century, there was a wave of Buddhist influence in the East Indies. Stone figures of the Buddha dating from this period have been found in Java, Sumatra and Celebes. The spread of Buddhism is further attested in the Chinese records. Hinduism still predominated in some parts, while others may have become mainly Buddhist, but probably both religions were practised side by side.

The seventh century was an era of convulsive change over the greater part of south and east Asia. Indian expansion over the archipelago waned and about the same time Hinayanist Buddhism gave place to Sivaism in Java and to Mahayanist Buddhism in Sumatra. According to Chinese sources, notably the account of I-tsing's pilgrimage which took place between A.D. 671 and 692, there were two states in Java and two in Sumatra at this period. There seems to have been a kingdom in western Java, but little historical evidence relating to it is available. In central Java a kingdom, known to the Chinese as Ho-ling or Kaling in its Indonesian form, was certainly well established in I-tsing's time. It was a centre of Buddhist learning, but Hinduism also probably survived. That the Hindu religion in its Sivaite form was favoured by a dynasty ruling in Kedoe (central Java) at the beginning of the eighth century is shown by an inscription of A.D. 732 relating that a King Sanjaya had erected there 'the most miraculous shrine of Siva in the whole world'. This is the first inscription in Java with a decipherable date; it is written in the Sanskrit language but in Pallava characters. It would seem, therefore, that the foreign element had not yet been completely assimilated. If a third kingdom existed in Java at this time it probably lay in the east of the island.

The two kingdoms known to exist in Sumatra in the seventh century were Malayoe and Sri-vijaya. In the first half of this century the chief state in the island seems to have been Malayoe (Djambi), while there was another state of some importance in Bangka. Sri-vijaya, which had its capital at Palembang, came to the fore during the next fifty years. After subjugating Malayoe, Sri-vijaya became the dominant commercial power in the archipelago and maintained this position for many centuries.

The emergence of local peoples combining Indian and native elements can be traced in Sumatra, as in Java. Thus an inscription of A.D. 683 is written in Old-Malay, mixed with Sanskrit, which indicates that the authors were no longer foreigners from India, but a local people, Indo-Sumatran. In the early part of the seventh

century the Indo-Sumatrans were Hinayanist in religion, but towards the end of the century they were converted to Buddhism of the Mahayanist creed.

THE SAILENDRA DYNASTY, A.D. 750-850

The rise of Sri-vijaya is associated with the Sailendra dynasty, which conquered Bangka and extended its power over Sumatra and the Malay Peninsula. After the death of Sanjaya, about the middle of the eighth century, we find the Sailendra dynasty ruling in central Java. A new impulse was given to letters, apparently to music, and, above all, to architecture. Indian influence is most marked, which suggests that there may have been a fresh wave of immigration shortly after the establishment of the dynasty. The great Buddhist temples of Boroboedoe and Tjandi Mendoet date from this period (Plates 11, 15). Buddhism did not wholly displace Sivaism, for temples to Siva were being built in many places and inscriptions testify to its survival, notably one of A.D. 847 at Gandasoeli, written in Old-Javanese with a tincture of Old-Malay. An obvious interpretation of the leading facts is that Sivaism was the popular religion, though Buddhism was favoured by the rulers.

Outside Java, the rule of the Sailendra extended over all, or almost all, of the archipelago and possibly over Cambodia and Champa. Chinese records and inscriptions, when read together with the long series of reliefs at Boroboedoe, depict a complex political and social organization. Then, suddenly and mysteriously, the Sailendra disappear from Java and seem even earlier to have lost their hold over Cambodia and Champa, but a branch of the dynasty continued to control Sri-vijaya for many centuries.

THE KINGDOM OF MATARAM, A.D. 850-1007

The Sailendra never extended their rule over east Java, which seems to have remained independent under descendants of King Sanjaya; presumably it was they who drove the Sailendra from central Java. Already in A.D. 863 at Pereng, in the main stronghold of the Sailendra, there is an inscription in a mixture of Sanskrit and Old-Javanese, paying homage to Siva. It may be taken to mark the birth of a new power, known afterwards as Mataram from the capital founded there a few years later. From the ninth century onwards Sivaism

gathered force at the expense of Buddhism, and the rise of the Mataram kingdom may be explained as the restoration in central Java of the old dynasty and the old religion. This view derives support from the architecture of the period; the Sailendra introduced new forms, but their successors combined these with a reversion to old forms. Moreover, the substitution of Javanese for Sanskrit in the inscriptions suggests the cultivation of popular support and a growing sense of Indo-Javanese nationality. From various inscriptions written in Old-Javanese it may be inferred that the Mataram kingdom soon moved to east Java and the central part of the island lost its former political importance.

The most prominent of the kings of Mataram in this period was Dharmavamça (A.D. 985-1007). He promulgated many new laws and fostered the growth of literature, causing the *Mahabharata* to be translated into Old-Javanese. Under his rule the authority of the kingdom was extended to Bali and to a small principality in west Borneo. The acquisition of the latter was probably mainly for strategic reasons, since Dharmavamça aimed at wresting from Sri-vijaya the commercial supremacy of the archipelago.

At this period the kingdom of Sri-vijaya under the House of Sailendra held sway over the eastern coast of Sumatra and its adjacent islands, and over the Malay Peninsula. It controlled the South China Sea and its traders used to visit the ports of China. It maintained commercial contact with the kingdoms of India, while its fame reached as far west as Arabia. Sri-vijaya soon came into conflict with the kingdom of Mataram. When Dharmavamça challenged its supremacy in the tenth century, Sri-vijaya for a time was in danger of being overthrown, but later recovered sufficiently to carry out a successful invasion of Java which led to the fall of the Mataram kingdom.

THE KEDIRI, JANGGALA AND SINGHASARI KINGDOMS AND THE DECLINE OF SRI-VIJAYA, 1007-1292

After the fall of the Mataram kingdom east Java split up into a number of petty states, but in 1019 Airlangga, the son-in-law of Dharmavamça, assumed power and gradually rebuilt the kingdom. His court is regarded as one of the fountain-heads of Javanese literature, producing the first poem in Old-Javanese for which a date can be fixed. The resurgence of the former kingdom was, however, short-lived for on the death of Airlangga in about 1045 it was divided

between his two sons. The state of Janggala, centring around Soerabaja and Malang, was at first the more important, but it soon yielded place to the western principality, with its capital at Kediri (Fig. 2).

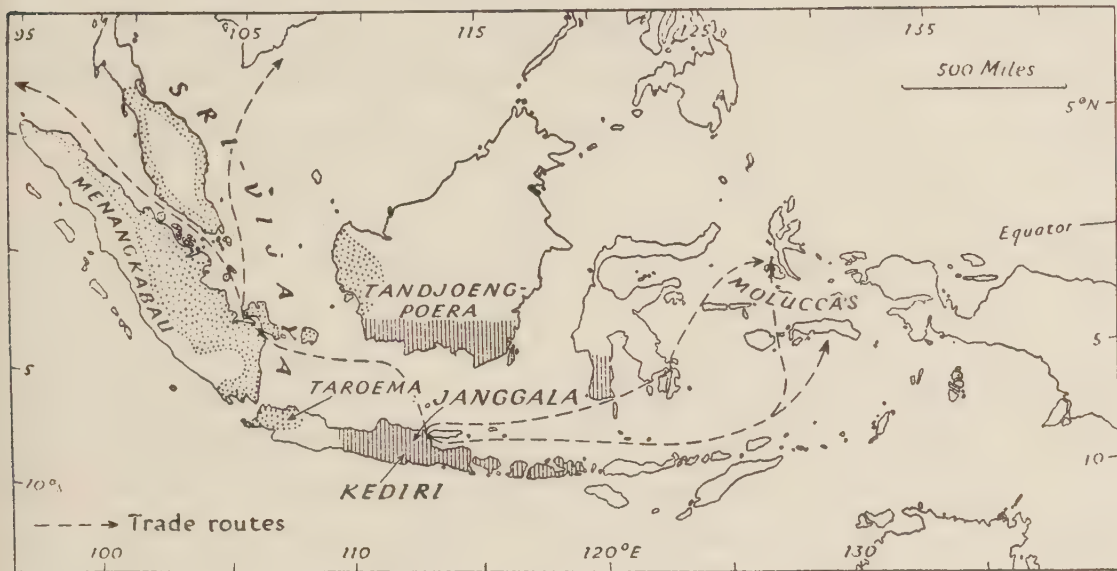


Fig. 2. The kingdoms of Sri-vijaya and of Janggala and Kediri in the eleventh and twelfth centuries

The dotted area shows the extent of the kingdom of Sri-vijaya, the shaded area that of the kingdoms of Janggala and Kediri. Of these last two kingdoms, the latter was the more powerful.

Source: Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago*, p. 2 (Cambridge, Mass., 1943).

The Kediri kingdom, like the earlier Mataram kingdom, engaged in widespread commercial activities over the archipelago and rivalled the sea-power of Sri-vijaya. During the eleventh century Sri-vijaya was weakened by a series of wars with the Cola kingdom of south India, as a result of which Kediri came to replace the Sumatran kingdom as the chief power in the archipelago. Kediri not only controlled many of the Lesser Soenda islands, including Bali, but also exercised its sovereignty over the southern coast of Borneo and the southern peninsula of Celebes. The commercial expansion of the Javanese kingdom took place contemporaneously with the arrival in East Indian waters of increasing numbers of Muslim traders from the west. These traders, who were all loosely termed 'Arabs', though few in fact came from Arabia, were destined to play an important part in the political affairs of the archipelago (see p. 46).

In the early thirteenth century, the Kediri and Janggala kingdoms were both forced to recognize the overlordship of the princes of Singhasari, a district in the kingdom of Janggala near the modern

town of Pasoeroean. East Java was thus again united into a single state and, under the rule of the great monarch, Kertanagara (1268–1292), the whole island seems to have recognized its sovereignty. The new kingdom successfully developed its overseas trade. It continued to prosper at the expense of Sri-vijaya and in 1286, after a Javanese invasion of Sumatra, Malayoe, under the suzerainty apparently of Singhasari, replaced Sri-vijaya as the chief state in the island. Shortly afterwards, in 1292, Marco Polo visited Sumatra and Java; in the record of his journey he mentions 'the great king of Java' and his immense overseas trade, especially in black pepper and all manner of spices.

In the year of Marco Polo's visit Kertanagara met his end. The Mongols, who had lately mastered China, sent an embassy to Java for the customary tribute and invited the king to pay homage to the Mongol court. Kertanagara sent the emissary back with an insulting message tattooed on his forehead, and an expedition was despatched to punish the king. It arrived too late. Kertanagara had just been assassinated by a rebel, apparently a connection of the former dynasty. The usurper did not long enjoy the fruits of his rebellion, for the Mongol soldiers, ordered to punish the king of Java, punished the king they found there. In the confusion that ensued the son-in-law of Kertanagara seized the throne.

THE KINGDOM OF MAJAPAHIT, 1292–1500

The son-in-law of Kertanagara founded a new dynasty with its capital at Majapahit, in the Brantas valley south-west of Soerabaja. In power and splendour the Majapahit kingdom far outshone that of Singhasari and Kediri. The foundations of its greatness were laid by Gajah Mada, who acted as prime minister for thirty years from about 1330 to his death in 1364. During his period of rule, the sovereignty of Majapahit was extended over Malayoe, Borneo, the Lesser Soenda islands, part of Celebes and parts of the Moluccas. The conquest of Palembang, a successor state to the empire of Sri-vijaya, was not completed until thirteen years after the death of Gajah Mada. By the end of the fourteenth century, when the Majapahit empire was at its fullest extent, it was roughly equal in area to the Netherlands Indies of to-day (Fig. 3). Majapahit also had friendly relations with the states on the mainland of south-east Asia, from Martaban to Annam, and sent embassies to India and China. Among the chief ports were Toeban, Grisee and Soerabaja. Merchants were

held in high repute and even the nobles engaged in commerce. A description of life in Java as given by a Chinese Muslim, Ma Huan, in 1413 shows that, allowing for the lapse of time, and changes in religious ceremonial consequent on the introduction of Islam, Javanese civilization was much the same as now; modern Javanese civilization still rests on its old foundation.

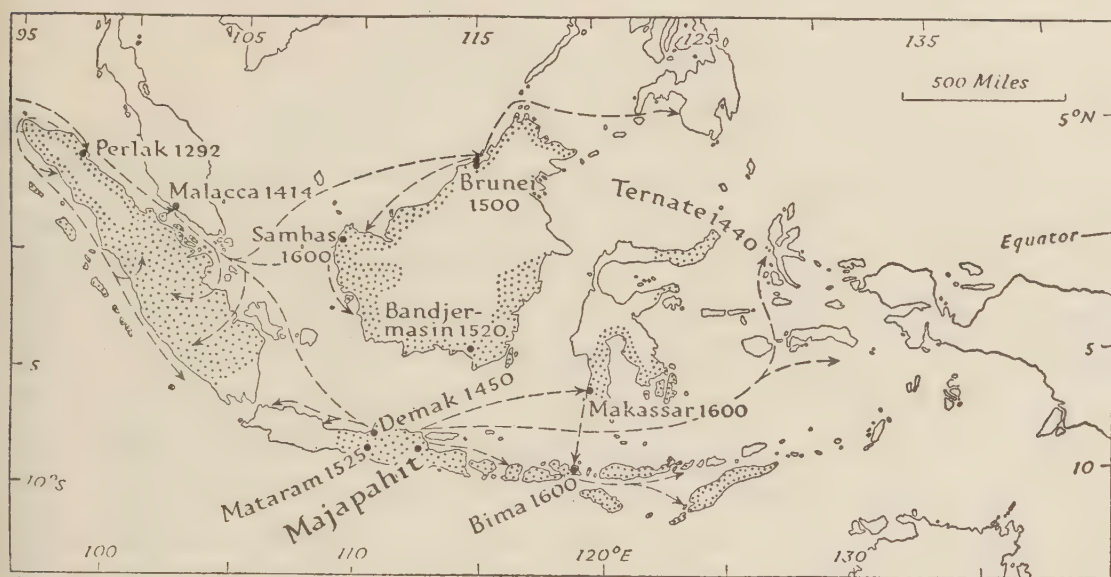


Fig. 3. The empire of Majapahit in the fourteenth century

The arrows indicate the spread of Islam; the dates refer to the year when Islam was first adopted.

Source: Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago*, p. 55 (Cambridge, Mass., 1943).

At the time of Ma Huan's visit, Majapahit had already passed its zenith, which may be placed at about the end of the fourteenth century. In 1405 there was a dynastic rebellion and, though this was suppressed, it left the central power weaker. Other factors were contributing to its decline. The fall of the Kediri and Singhasari dynasties had been followed by a great extension of Muslim influence throughout the coastal districts of the archipelago, and the seaboard chieftains who were converted to the new faith tended to become less dependent on their Hindu suzerain. At the same time the progress of China under the Ming dynasty, and the expeditions, partly military, partly commercial, under Cheng Ho (1405-34) encroached on the commerce of Majapahit from the opposite direction. In Sumatra, the supremacy of Java had centred round its dependency in Malayoe, but, with the rise of Malacca under Muslim rule, Malayoe could no longer control the straits. Malacca was a centre of trade and propa-

ganda and both commerce and religion sapped the strength of Majapahit, while at the same time it was weakened by dynastic quarrels, and by the end of the fifteenth century many of the feudal nobles had become Muslim. In 1518 the kingdom of Majapahit was finally destroyed by the sultan of Demak who ruled the coastlands of Java from Djapara to Grisee.

THE EXPANSION OF ISLAM, 1292-1500

The propagation of Islam followed the trade routes of south-east Asia. From Gujerat in India the new religion spread first to the northern tip of Sumatra and the Malay Peninsula, then to east Java and from there to the islands of the east. In 1292 Marco Polo found Islam adopted in only one small state, namely, Perlak, in north Sumatra. The new religion must have spread very soon to the neighbouring state of Pasé where a tombstone, dated 1326, records the death of a Muslim sultan. The account of Sumatra given by Ibn Batuta, who claims to have visited the island in 1345-46, is certainly inaccurate on some points and as a whole untrustworthy, and there is no further information of importance before the report submitted by the Muslim customs official, Ma Huan, about 1430. He tells us that in the ports of Java and especially in Gresik (Grisee) there were Muslim traders from the west, and a few Chinese Muslims. That Islam had as yet barely touched Java is indicated by a tombstone recording the death in 1419 of Malek Ibrahim who, though probably a trader, survives in tradition as the first missionary of Islam.

By the middle of the fifteenth century Malacca had become the headquarters of Muslim power in the Far East and about the same time Islam reached the islands of Ternate and Tidore in the northern Moluccas (Fig. 3). In Java, however, Hinduism still prevailed, except on parts of the coast. De Brito, writing in 1514, says 'Java is a great island; it has two powerful kings; on the sea coast the Moors are very powerful'. One of these kings was the emperor of Majapahit, whose power, however, was shortly afterwards destroyed by the sultan of Demak; the other ruled over Payayaran, the western end of Java, known to the Portuguese as Soenda. At the beginning of the fourteenth century western Java had still been subject to Sumatra. Payayaran became independent about 1405, a change which probably reflects the shifting of power from Majapahit towards Malacca. In 1522 Payayaran was still Hindu and the sultan invited the Portuguese to build a fort there as a barrier against the encroachments of the

Muslims. On their arrival in 1526 they found the Muslims already in possession, the sultanate of Bantam having replaced the kingdom of Payayaran; eastern Java shortly before this also passed into Muslim hands. The extension of Portuguese influence over the archipelago was retarded and made more difficult by the spread of Islam, for, wherever it took root, active or passive hostility to the European traders generally followed.

THE PORTUGUESE IN THE EAST INDIES, 1500-1600

The Portuguese were the first European traders to sail in East Indian waters. They sought primarily to gain a monopoly of the spice trade, and as Malacca was the great market for this commodity its conquest became their foremost objective. This was achieved in 1511 by a fleet under Alfonso de Albuquerque. At Malacca the Portuguese found that spices cost five to seven times as much as in the islands where they grew. Albuquerque promptly despatched an expedition to the Moluccas. The Portuguese fleet, commanded by Antonio d'Abreu, first called at Gresik on the north coast of Java and then sailed to Banda, the chief island for the production of nutmegs. On the return voyage one of the ships was wrecked and the survivors found refuge in Hitoe (Amboina), where they helped the local chieftain to defeat a rival. Their fame reached Ternate and the ruler of this island promised them trade in return for their support. Thus, although only one ship of the Portuguese fleet returned safely to Malacca, the expedition succeeded in its object of opening up relations with the Spice Islands.

In the eastern islands of the archipelago the decline of Majapahit and the growth of Muslim influence had led to a struggle for supremacy between four small states: Djailolo, Batjan, Ternate and Tidore. Political ties were personal rather than territorial, and the ruler of each state had his adherents throughout the archipelago, as far south as Banda. Thus, in Amboina there were four parties owing allegiance severally to these four kings, and constantly at war. At first Djailolo was the most powerful, but later Ternate and Tidore came to the fore. The Portuguese visited Ternate in 1512 and were invited to found a station there. They could not take advantage of the offer, however, until 1522, and meanwhile in 1521 the Spaniards had reached Tidore. The Moluccas were near the meeting point of the spheres of influence which Spain and Portugal had marked out for themselves in the treaty of Tordesillas of 1494. An attempt was made

to settle the dispute by the treaty of Saragossa in 1529, by which Charles V sold the doubtful Spanish claims over the Moluccas to his Portuguese rivals. Arrangements made in Europe, however, had little influence on conditions in the East, for in 1537-38 the Spaniards of Tidore attacked the Portuguese in Ternate. Hostile relations continued until the end of 1545 when the Portuguese, reinforced from Malacca, drove all the Spaniards who would not enter Portuguese service out of Tidore.

Meanwhile the Portuguese had been exploring the whole archipelago. Expeditions had reached Borneo (1524), Celebes and New Guinea (1525-26) and Timor (1532). Interest in Borneo waned on finding that it produced only camphor, and in Celebes, on failing to discover gold. Outside Malacca their only important settlements were in Bantam, Ternate, Amboina and Banda. Bantam was important as commanding the strait by which vessels could escape the control exercised by the Portuguese at Malacca. Ternate was the headquarters of the spice trade, and Amboina and Banda respectively the chief sources of cloves and nutmegs. The principle of Portuguese rule, as of subsequent European empires, was to recognize a local potentate who would comply with their requirements, and to support him against his subjects and jealous neighbours; in practice it was a brutal and arbitrary tyranny tempered by assassination, and in some degree by Christianity. In 1537 a seminary was established at Ternate, the first institution of its kind in the East, and great progress was made in the conversion of the people, especially from about 1540 onwards when St. Francis Xavier was active in the archipelago. (Fig. 4). The methods of conversion were often summary, and even the priests were only too ready to condone the extirpation of those who would not accept the faith. It followed naturally that the numerous outbreaks of resentment against oppression were directed equally against Portuguese and Christians. Ordinarily these outbreaks were isolated, though sometimes they took on a more general character. Thus, in 1570, Baabullah, the ruler of Ternate, moved to fury by the assassination of his father, formed a league with all the neighbouring princes and within a few years had hemmed the Portuguese within their forts. They feebly maintained a losing struggle until in 1580 help came from an unexpected quarter. Philip II of Spain made good his claim to the throne of Portugal, and the Portuguese in the Moluccas could turn for help to the Spaniards in the Philippines. A combined garrison of Portuguese and Spaniards was still able to maintain a precarious hold over the fort in Tidore and another stood

fast at Amboina; but the power of the Portuguese was broken, and in 1600, as in 1500, it seemed that the archipelago would pass to the Muslims.

EUROPEAN COMMERCIAL RIVALRY IN THE EAST INDIES, 1600-84

The union of Spain and Portugal in 1580, which gave a new flicker of vitality to Portuguese power in the archipelago, was eventually disastrous to both countries. Up till then the products of the East, after reaching Portugal, had been distributed over Europe mainly by the Dutch. By his control over Portugal, Philip II was enabled in 1594 to close the Portuguese harbours to his rebellious Dutch subjects, who were thus left with a choice between abandoning a valuable trade or themselves venturing on the Eastern voyage. For many years the Dutch had indeed been sailing in the Atlantic Ocean and exploring the North-East Passage, while many Dutchmen had sought employment in Portuguese ships and service. Details on the navigation of the southern Atlantic and Indian Ocean were, moreover, well known for, in 1596, the Dutch geographer, Jan Huyghen van Linschoten, after spending six years in Goa, published his *Navigatio ac Itinerarium*, containing all the necessary information for the voyages to India and America. This book also revealed how slender was the Portuguese grip upon the Eastern seas. There is little doubt, therefore, that Dutch merchants would in time have found their way to East Indian waters. The action taken by Philip II in 1594 hastened but did not cause this development.

The first Dutch expedition to the East Indies was despatched by an Amsterdam company in 1595 and the successful, though not profitable, outcome of this venture led to a fever of speculation. Within less than five years ten companies had been formed, sending out fourteen fleets, comprising sixty-five ships, of which fifty-four made the return journey safely. In 1599 the Dutch were able to raise the price of pepper on the London market from three shillings a pound to six or eight shillings. This corner in pepper led to the formation of the English East India Company in 1600. Meanwhile as experience had shown that competition between the Dutch companies could only lead to disaster, they were grouped together and in 1602 received a common Charter as the Dutch East India Company. On the formation of this company all those interested in the Eastern trade were grouped into six Chambers, one for each of

the chief ports of Holland, and the Charter of Foundation was primarily a contract between these Chambers as autonomous mercantile bodies, stating the terms on which they agreed to unite with a view to obtaining from the State a monopoly of the Eastern trade. The Charter conferred on the Company many attributes of sovereignty, and in effect it became an oriental potentate. The primary aim of the Company was profit, first by trade and later largely by tribute. Only with reluctance and in order to control the trade did it extend its rule. Not until the middle of the eighteenth century, when the trade in spices was losing its importance, did it assume the privileges of sovereignty so far as was necessary to obtain a tribute in produce, and never outside its settlements and factories did it accept the responsibilities of sovereignty.

At the same time as the Dutch and English formed trading companies in the East Indies the French became interested in the Eastern trade and, after an expedition to Bantam in 1601, a French East India Company was founded in 1604. The rivalry of these companies and their common quarrel with the Portuguese and Spaniards, forms a main theme in the history of the archipelago for the next eighty years.

The first port of call for all the newcomers was Bantam, on Soenda strait for, though the Portuguese had a settlement there, they were not so firmly entrenched as at Malacca. The Dutch opened an office at Bantam in 1600 and three years later obtained a stone building which they could use as a *loge* or factory; the French established an agency in 1601 and the English settled a factory there in 1602. Although this port remained the general headquarters for some years, the Spice Islands were the main objective, and here it was necessary to dispose of the Portuguese and Spaniards. In 1599 the Dutch had obtained permission to establish factories in Banda and Ternate, and to build a fort in Amboina. Six years later they effected their first settlement by driving the Portuguese out of Ternate and Amboina. After losing Amboina the Portuguese were penned up in Malacca where they could do little harm, though remaining a potential danger until isolated by the Dutch capture of Ceylon in 1640. This enabled the Dutch to take Malacca in 1641.

The Spaniards were more troublesome. Although the Dutch managed to eject the Portuguese from Ternate in 1605, they could not withstand a strong Spanish fleet that arrived in 1606. The Spaniards settled not only in Ternate but also in their old stronghold, Tidore. In 1609, the United Provinces concluded a truce with Spain

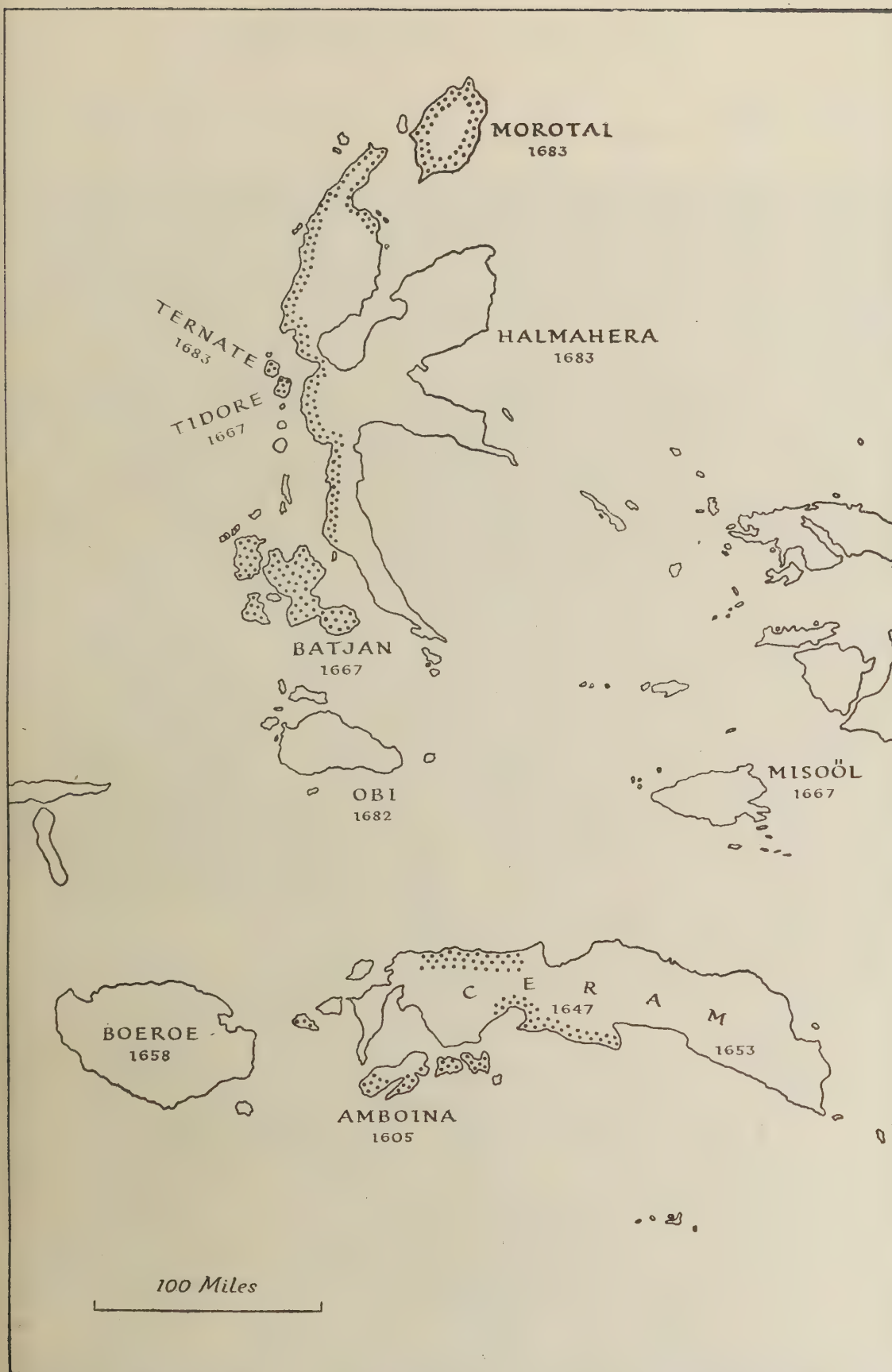


Fig. 4. The Moluccas in the sixteenth and seventeenth centuries

The dotted area shows the extent of Portuguese missionary activity. The dates give the year when Dutch sovereignty was first recognized. In the Moluccas, as in most of the other islands of the archipelago, Dutch control, however, was loose and mainly nominal until the nineteenth century.

Source: Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago*, p. 77 (Cambridge, Mass., 1943).

for ten years, but the Spanish governor of the Philippines disclaimed all knowledge of the matter and hostilities continued. In 1613 an attack on the Spanish fort in Tidore was beaten off; in 1616 the Dutch sustained disaster in the bay of Manila and a renewal of the attack in the following year was also unsuccessful. In Ternate they found a willing ally against Tidore and the Spaniards, but there were continual difficulties until Spain withdrew from the Moluccas in 1663.

The chief rivals to the Dutch were the English who followed them round the archipelago wherever they went. In the early years of the seventeenth century the English established a factory at Bantam, opened relations with Amboina and Banda, sat down alongside the Dutch factory at Soekadana in Borneo and caused trouble in Makassar. In 1614 the English followed the Dutch to Jacatra, their new headquarters in Java. This was an open challenge to a direct trial of strength, and its significance was emphasized by the establishment at the same time of English trading posts in Sumatra, not only at Tikoe and Djambi, but at Atjeh, a vital spot in the line of communications between Bantam and the West.

The challenge to Dutch power was taken up by Jan Pieterszoon Coen, who, on his appointment as Governor-General in 1617, warned the home authorities that they must be prepared to fight.* The English were trading openly with the Spaniards and in 1617 they drove off two Dutch ships which threatened the station at Poelau Roen, off Banda. Coen retaliated by a proclamation closing Banda, Amboina and other islands of the Moluccas to the English. Just then two English fleets, of fifteen ships in all, arrived off Bantam. Coen warded off the first attack and, hurriedly collecting reinforcements, drove them out of Jacatra, where in 1619 he founded the settlement that is now Batavia. He followed up his success at Jacatra by destroying an English fleet of four ships off Tikoe, and next year turned the English out of the Banda islands.

In 1619, when the English were ejected from Jacatra, the Netherlands government in Europe concluded a treaty allowing them a share in the Eastern trade. No treaty, however, could put the English on a level with the Dutch. The Dutch company had always more ships at its disposal than the English company. Coen took full advantage of his superior strength and the tension grew until it

* Jan Pieterszoon Coen, a native of Hoorn, was appointed Governor-General when he was scarcely thirty years of age. He returned to the Netherlands in 1622, but took office again in 1627 and remained in the East until his death in 1629.

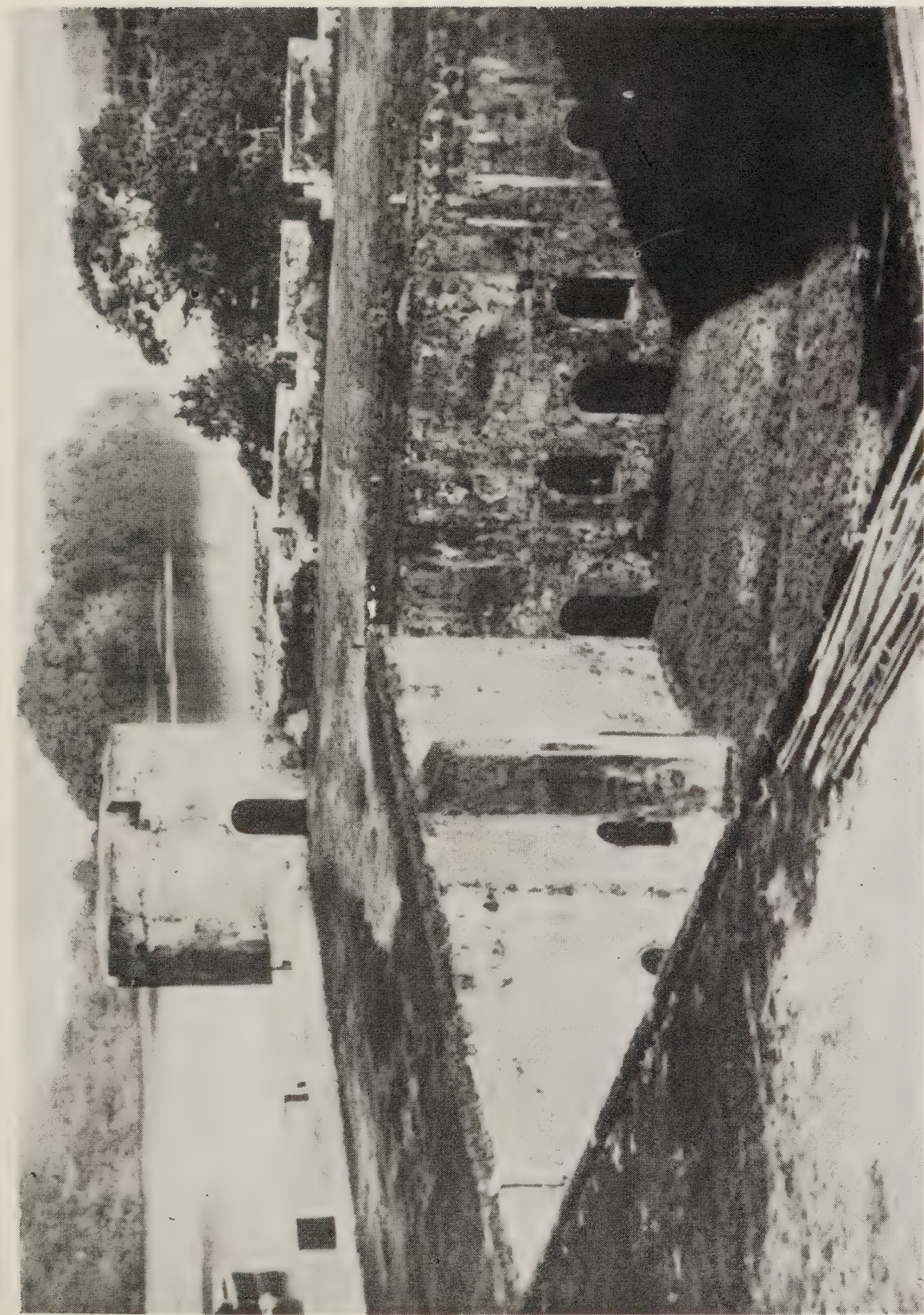


Plate 24. Fort Nassau, Bandaneira

Many forts of this kind were built by the Dutch in the East Indies in the seventeenth and eighteenth centuries.

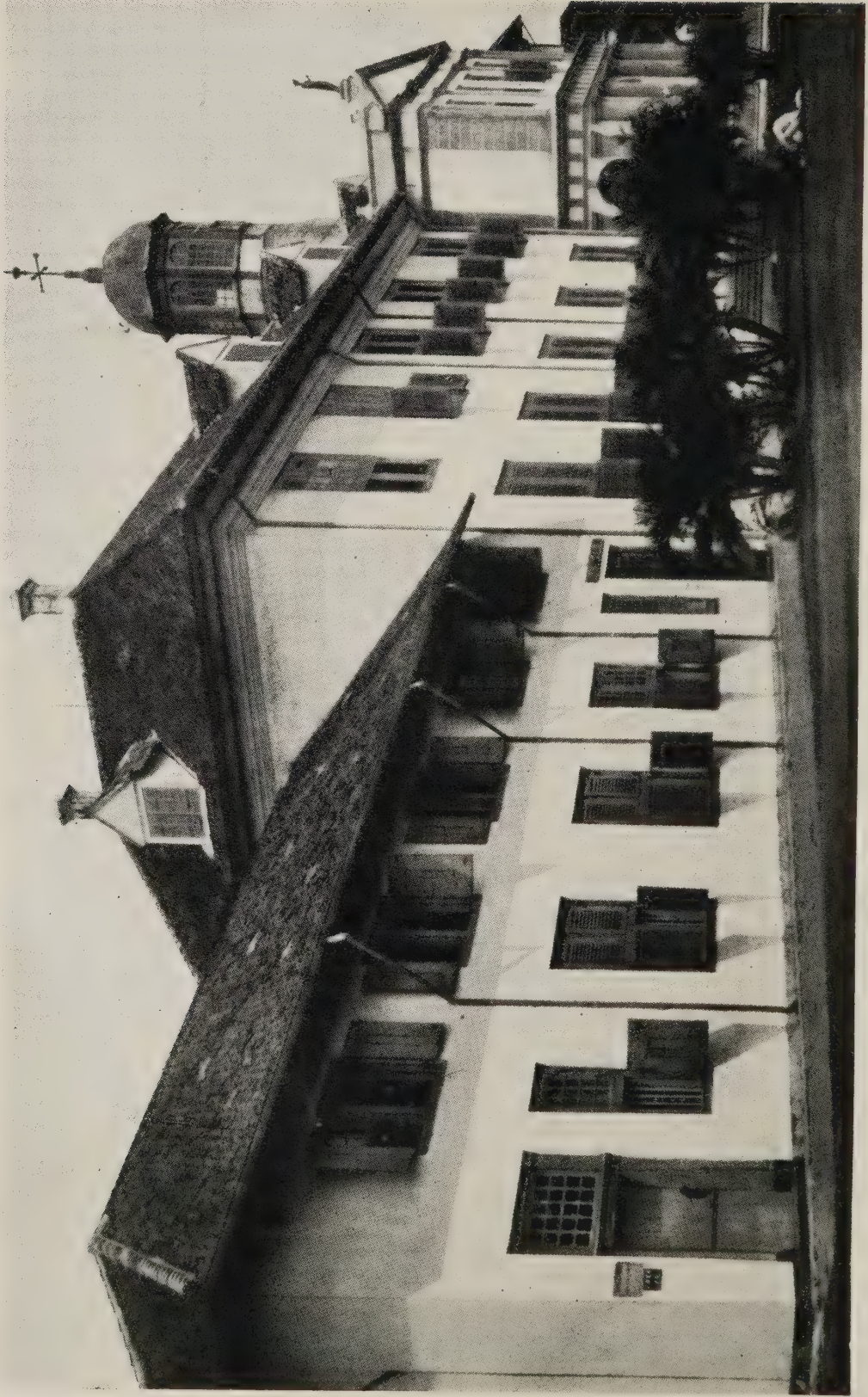


Plate 25. Town Hall, Batavia
A fine example of Dutch colonial architecture, dating from 1710.

came to a head in Amboina, where five English factories carried on their business under Dutch rule. Early in 1623, the Dutch governor charged the English with a conspiracy to seize the fort. Confessions were exacted under torture, and ten Englishmen were sentenced to death, and executed the same day. The so-called 'Massacre of Amboina' caused a great stir in England and measures were taken to obtain redress. The English traders in Bantam no longer felt secure and they all took refuge in Lagoendi, a small island in Soenda strait. In 1628 fever in Lagoendi drove them back to Bantam, but they never recovered the ground which they had lost. The French also maintained a small factory in Bantam and carried on a little trade with Sumatra, Celebes and Japan. Neither French nor English, however, could offer any serious challenge to Dutch power, and the extension of Dutch rule over Bantam towards the close of the seventeenth century caused them to withdraw from the archipelago, though in the eighteenth century the English built factories at Benkoelen, Natal and Tapanoeli in Sumatra.

THE RISE OF DUTCH POWER IN JAVA, 1600-84

On account of its favourable position Java was selected by each of the European trading companies as the main base for their activities in the archipelago. As already mentioned, the Dutch established a station at Bantam in 1600, but when the English and French set up as rivals here they determined to extend their influence to other places in west Java. At that time the ruler of Jacatra, a small province bordering on Bantam, was ambitious of gaining independence, and hoped for Dutch assistance. In 1610 he granted them a site, but would not allow them to build a fort unless they would withdraw from Bantam. The Dutch, however, wanted a footing in both places so as not to depend wholly upon either. The negotiations dragged on and were rendered more delicate by the arrival of the English in 1614. The vigorous policy of Jan Pieterszoon Coen, which led to the eviction of the English from Jacatra and to the foundation of Batavia in 1619, has already been described (see p. 52). The foundation of Batavia marked a new stage in the rise of Dutch power. In order to make this base secure, the Company naturally sought to build up buffer states which would admit its suzerainty and to reduce independent states to a position of dependence. This extension of Dutch political activity in Java took place contemporaneously with increased Dutch activities in the other islands of the archipelago (see p. 59).

After the conquest of Jacatra (Batavia) the Dutch claimed authority over a strip of land from the north to the south of Java, but in fact it did not extend beyond the environs of Batavia. For some years they were hard pressed to hold their own against Bantam and Mataram, the two Muslim states which had been formed in the early sixteenth century. Bantam held the west of Java and Mataram the middle and east; between them lay Cheribon and Preanger, to which both laid claim, and Krawang, which was not effectively ruled by either. The ruler of Bantam resented the loss of Jacatra and the fall of revenue which followed the withdrawal of the Dutch factory in Bantam. He attacked the Dutch in 1622 and they replied by blockading his capital. A new turn of events occurred when in 1625, Sultan Agoeng, the ruler of Mataram, after conquering Madoera and Soerabaja, assumed the style of Soesoehoenan, or Emperor. His new power and new pretensions placed the Dutch in a critical position. Agoeng was not unwilling to recognize Dutch claims to territories which they had gained at the expense of Bantam, if they would recognize him as overlord and help him subdue that state. These conditions the Dutch refused, as their policy was to hold a balance between Bantam and Mataram, and, after an unsuccessful attack by Bantam on Batavia, the Dutch came to terms with Bantam and agreed to re-open their factory. They were only just in time, for in 1628 and again in 1629 Mataram delivered ferocious attacks on Batavia which they were barely able to withstand. Meanwhile the traders in Bantam were taking advantage of the difficult position of the Dutch to encroach on their monopoly of the spice trade. From these dangers the Dutch were delivered by the capture of Malacca in 1641 which weakened Java by cutting off its trade. Two years before this occurred, however, Bantam had agreed to stop trading with the Moluccas. Agoeng, the Soesoehoenan of Mataram, vainly sought help from Bantam, from the English, and from Palembang; but his attempts to raise a combination against the Dutch were ended by his death in 1645. His successor, Amangkurat I, was of milder temper and when he promised to forbid trade with the Moluccas, except under a Dutch pass, the Dutch agreed to recognize him as suzerain and to help him if attacked.

For nearly a quarter of a century after the agreement of 1646, the Dutch had little serious trouble with Mataram. Then in 1669 there was an influx of refugees from Makassar into both Bantam and Mataram. Amangkurat I, the Soesoehoenan of Mataram, had earned the general hatred of his subjects by arbitrary and oppressive rule

and they were easily incited by the refugees to rebel against him. He called on the Dutch for help under the agreement of 1646, and they complied all the more readily because the rebellion had cut off the supply of rice from east Java on which Batavia depended. During the confused operations Amangkurat I died, and there was a dispute as to the succession. The rightful claimant, Amangkurat II, was wholly dependent on Dutch support, and they took advantage of it by insisting on rigorous terms. He granted them Krawang and part of Preanger, thus enlarging their territory to the south coast, and also Semarang and its environs; he also mortgaged as security for the war costs all the ports east of Batavia on the north coast of Java, and conceded various trading privileges, including a monopoly of the import of Indian and Persian manufactures and of opium. Thus, when in 1680, the Dutch succeeded in placing him on the throne, they were in effect masters of the whole of central and east Java.

The settling of affairs with Mataram in 1680 left the Dutch free to take measures against Bantam, which they did so effectually that Sultan Abulfatah declared war. In the following year, after a palace revolution, he was succeeded by his son, who was well disposed to the Dutch and promptly made peace. Peace with the Dutch, however, bred trouble with his own subjects who rose against him. The Dutch came to his assistance and in 1682 suppressed the rebellion. The sultan in return undertook to evict all foreigners, except the Dutch, who were granted a monopoly of the export of pepper and the import of manufactures into Bantam and its dependency, the Lampoeng district of Sumatra; further, in 1684, he forewent all claims on Cheribon. Thus, by 1684 the Dutch stood out as the chief power over the whole of Java.

THE CONSOLIDATION OF DUTCH POWER IN JAVA, 1684-1780

The sultan of Bantam, who had succeeded to power in 1681, stood by his agreement with the Dutch, whose position grew stronger with the lapse of time. Bantam, moreover, was losing much of its former importance by the silting up of its river, so that it could no longer compete with Batavia in trade. In 1734, there succeeded a new sultan, wholly under the influence of a wife who aroused general hatred. By promising large concessions, she induced the Governor-General in 1747 to recognize one of her relatives as heir-apparent, and in the following year, when the sultan went mad, she was appointed 'Regent on behalf of the Company'. Her oppressive rule

caused a rebellion, and the Dutch seized the occasion to substitute as regent a younger brother of the sultan. For some months the issue remained doubtful, and in 1751 the rebels, supported by the English in Benkoelen, even threatened Batavia. On the abdication of the sultan in 1752, the Company recognized the lawful claimant as his successor and peace was restored. The new sultan acknowledged himself a vassal of the Company, and Bantam gave no further trouble.

The course of events in Mataram was very different. Amangkurat II, the Soesoehoenan who had been placed on the throne by the Dutch in 1680, soon turned against them, and six years later attacked some troops sent to request the due observance of his contract. This was not thought sufficient ground for breaking off relations, with the consequent loss of trade, but tension continued until the death of Amangkurat II in 1703. The lawful heir would not confirm the existing contracts with the Dutch, who therefore gave their support to a rival claimant and thus became involved in the first Javanese succession war. By 1705 they were able to place their candidate on the throne, though hostilities did not cease until 1708. As a reward for their services, Pakubuwana I, the new Soesoehoenan, abandoned all his claims on Cheribon, and ceded the rest of Preanger and the eastern half of Madoera; moreover, as compensation for their war expenditure, the Company were allowed to demand produce from the subordinate chieftains in Mataram, either free of cost or on a nominal payment.

Political affairs in Mataram were far from being settled. The new Soesoehoenan, as an unlawful usurper, who had gained his throne by alliance with the infidels, found himself dependent on them to maintain it. There were repeated outbreaks in which the Dutch troops intervened, and in 1719 the death of Pakubuwana I was the occasion for the second Javanese succession war which lasted till 1723. Ten years later the Company claimed as their reward a tribute of free rice and the suppression of coffee-planting in Mataram, so that they could enjoy a monopoly over this crop. These oppressive terms did not favour good relations, and the secret discontent broke out into open hostility when the Dutch found themselves in difficulties with the Chinese.

The Chinese had been trading in Bantam long before the arrival of the Dutch, and in Batavia the Dutch had encouraged them as 'an industrious, diligent and unarmed people'. They rapidly increased and in the eighteenth century the number was estimated at not less than a hundred thousand. Many of these the Company in 1734

ordered to be deported. Others took refuge in the interior of Java, where they lived as bandits, and at length became a serious menace to Batavia. The Dutch thought to be rid of the menace by a general massacre of the Chinese, who were slain by thousands. Many Chinese fled to Mataram and the Soesoehoenan, Pakubuwana II, seized the occasion to throw off the Dutch yoke and proclaim a Holy War, the Java-Chinese War of 1741-43. The Soesoehoenan and his vassal in Madoera attacked Semarang, but when driven off by the Dutch they asked for pardon. The Chinese recalled a grandson of the last legitimate ruler, banished in 1708, and continued the struggle. They were unable, however, to stand out against the combined weight of Dutch force and the influence of the Soesoehoenan, and the war was brought to an end in 1743. As usual, one condition of peace was a new contract on more onerous terms. The Soesoehoenan surrendered to the Company all rights over Djapara, Rembang, Soerabaja, West Madoera and the land east of Pasoeroean; the vassals of the Soesoehoenan were required to acknowledge the Company as their supreme lord; and the Company was allowed to garrison certain places at the expense of the Soesoehoenan. Further the Company was granted the right of coinage, and an option over all produce. The ruler of West Madoera, who had looked to the Company to reward his help, was disappointed, rose against it, was defeated, captured, and banished to Ceylon. One of his sons, however, on accepting the Company as his overlord, was recognized as regent of West-Madoera (1745).



Fig. 5. Dutch acquisition of the native states of Java

Source: (1) *Atlas van Tropisch Nederland*, plate 10 (Batavia, 1938); (2) Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago*, p. 153, (Cambridge, Mass., 1943).

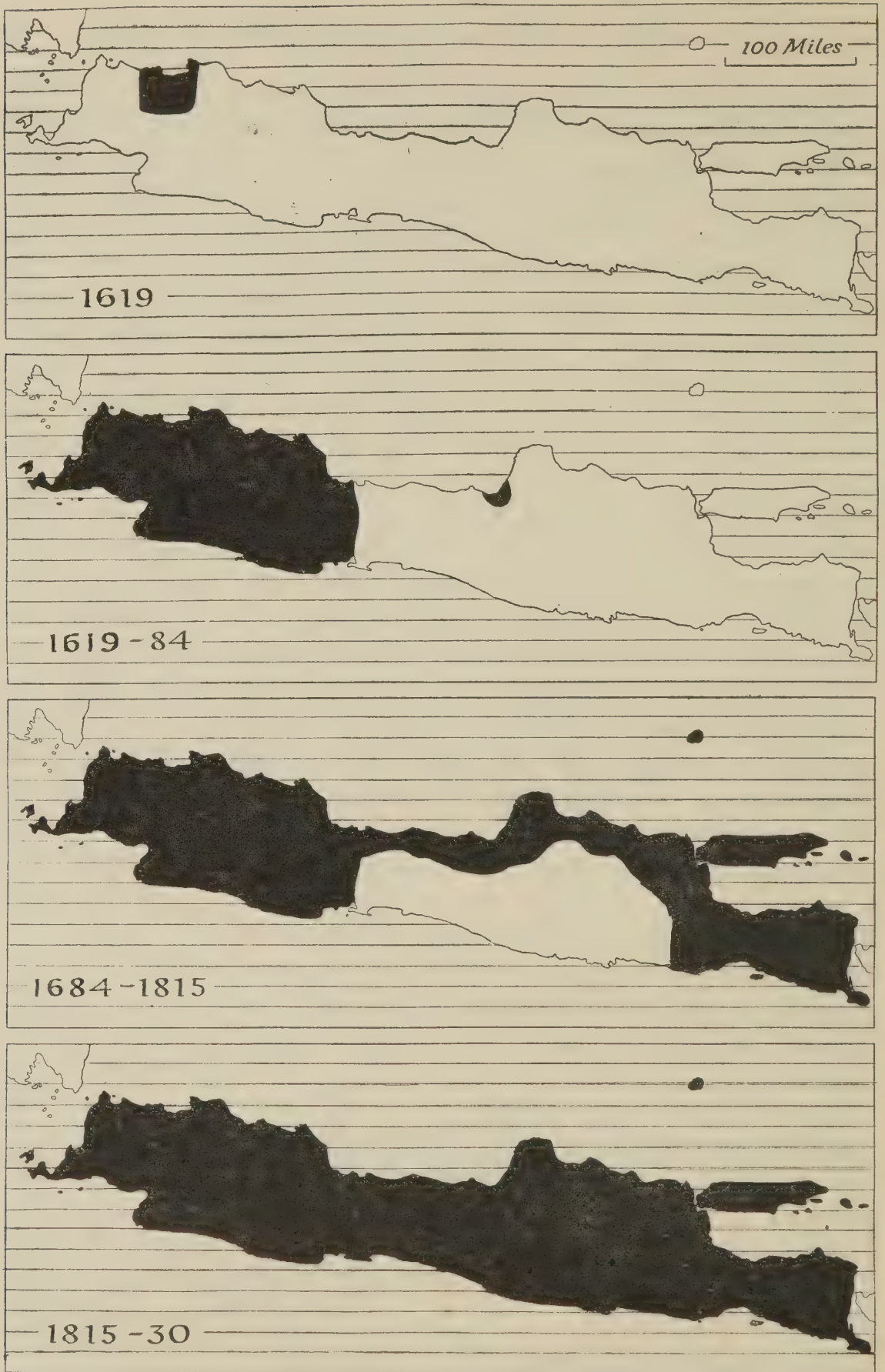


Fig. 6. Dutch acquisition of Java

Source: (1) *Atlas van Tropisch Nederland*, plate 10 (Batavia, 1938); (2) Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago*, p. 153 (Cambridge, Mass., 1943).

Meanwhile the concessions of the Soesoehoenan of Mataram had stirred up his more influential subjects to revolt. Five of his brothers ravaged the country with armed bands, and still more powerful was a nephew, known subsequently as Mangkoe Negoro. In 1746 they were still further incensed because the Soesoehoenan ceded Tegal and Pekalongan and alienated to the Company some of his customary dues; the Company in return wrote off his debts, promised a yearly subsidy, and acknowledged a favourite son as his successor. This last condition was fatal, for it precipitated the third Javanese succession war (1746-51). Even after the Company had placed their client on his throne trouble continued, and in 1755 the Soesoehoenan was induced to acquiesce in the division of Mataram into two states, namely, Soerakarta, the ruler of which was to bear the title of Soesoehoenan Pakubuwana, and Jogjakarta, which was allotted to an uncle as an hereditary vassal of the Company, with the title of Sultan. Both these states still exist. The claims of Mangkoe Negoro still remained unsatisfied, until in 1757 he obtained recognition as a vassal of the Soesoehoenan over the territories which since then have been known by his title. This brought the whole of Java under Dutch rule, direct or indirect, though the native states of Soerakarta, Jogjakarta, and Banjoemas were not finally brought under subjection until the third decade of the nineteenth century (see pp. 83-4 and Fig. 6).

THE GROWTH OF DUTCH RULE IN THE OUTER PROVINCES, 1600-1800

The growth and consolidation of Dutch rule in Java in the seventeenth and eighteenth centuries was paralleled by an extension of their control over the rest of the East Indian archipelago. By about the middle of the eighteenth century only the two islands of Bali and Lombok remained free from their authority. Everywhere, except in Java, however, this authority was limited to the coastal areas, though the Dutch held nominal if not actual control of the interior of the islands.

Sumatra

For nearly a century before the capture of Malacca by the Dutch in 1641, the state of Atjeh in the north of Sumatra held political and commercial sway over a large part of the island and was at the summit of its power in the first quarter of the seventeenth century. Its glory soon waned, however, for in the same year as the capture of Malacca the sultan of Atjeh granted the Dutch a monopoly of trade along the

west coast and in 1649 approved fixed rates for the exchange between imported manufactures and pepper. The sultan, moreover, could no longer control his provinces, which included a large part of the east and west coasts of Sumatra (Fig. 7); as these provinces declined to



Fig. 7. The principal states in the East Indies in the seventeenth century
M. The state of Menangkabau.

Source: Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago*, p. 136 (Cambridge, Mass., 1943).

facilitate Dutch trade, the Dutch blockaded Atjeh and in 1659 the sultan granted them a monopoly in all his ports and half the tin from Perak. The sultan was unable to enforce these arrangements, and the Dutch further undermined his power by dealing directly with the local rulers. The states of the west coast, Perak, and finally in 1669, Deli, regained their independence, and Atjeh was reduced to its old boundaries. For the next two centuries, although there was no open war, Atjeh showed its resentment by trading so far as possible with the British, and no Dutch ship could approach Atjeh under its own flag without danger of attack.

Negotiations with the states of the west coast led to the conclusion of the treaty of Painan in 1663 by which the local heads placed themselves under Dutch protection against Atjeh. Two years later a post was stationed at Tjinkoe island, but transferred afterwards to Padang, the port for the state of Menangkabau, which for many centuries had held a loose control over part of the western mountain region. Padang remained a liability rather than an asset and when the British founded a station at Benkoelen in 1714 all trade gradually passed into their hands. So little importance did the Dutch attach to Padang that they

acquiesced in the establishment of British settlements at Natal in 1751 and at Tapanoeli in 1755. Then in 1778 and 1793 they withdrew their posts from Baroes and Airbangis because trade had ceased.

In south Sumatra the Lampoeng district belonged to Bantam, and the pepper from that region was an important item in the tribute paid by Bantam to the Dutch. This gave the Dutch an interest in maintaining peace and order there, and in 1738 a fort was built at Toelangbawang as a protection against raids from Palembang. In 1763 another was built at Semangka with a view to ejecting the English from Benkoelen. By this time, however, the Dutch had lost their former energy, and the sultan of Bantam had no independent power. The Lampoeng district degenerated into a nest of pirates, and in 1793 both posts were withdrawn.

From the earliest days the Dutch traded intermittently with Palembang, and in 1640 the ruler, when threatened by both Bantam and Mataram, sought their aid. Largely through fear that otherwise he might turn to the English, the Dutch agreed to establish a stronghold in the capital, a project subsequently abandoned. Closer acquaintance with the Dutch inclined the sultan more favourably to Mataram, and the Company therefore compelled him in 1642 to grant it a monopoly of pepper in return for a treaty of mutual defence. The Dutch exercised their rights so stringently as to arouse resentment, which broke out in 1657 in an attack on two of the Company's ships. This led to war and, after a stiff resistance, to the conquest of Palembang in 1659. A new treaty confirmed the monopoly and granted them a strip of territory on which they built a fort overlooking the royal palace. After that relations were friendly. In 1681 the Dutch helped the sultan against Djambi, and were rewarded with a monopoly of the import of opium and the grant of jurisdiction over all foreigners. In 1722 the Dutch again helped the sultan, this time against a local rebellion, and received a monopoly of the tin from Bangka which, together with Billiton, had accrued to Palembang by marriage. The monopoly of tin was confirmed in 1755. As Dutch power declined, the smuggling of pepper and tin increased, and the settlement gradually lost all its influence.

Further north the Dutch, in the interest of the pepper trade, maintained relations with Djambi, for the most part friendly, from 1616 onwards. In 1724, however, they withdrew from this kingdom in consequence of an attack on their post at Moearakompeh. Along the coast north of Djambi there were numerous petty states, nominally subject to Siak, which was itself in name a dependency of Johore.

In 1745 the ruler of Johore, in return for Dutch support against the Boeginese, surrendered to the Company his claims over Siak. The Dutch, however, took little interest in their new possession until forced to do so by the intervention of Boeginese pirates, who were a serious threat to the security of traffic and to the straits. After a prolonged struggle which ended with the occupation of the country in 1761, the Dutch were content to maintain relations, generally friendly, with a succession of local rajahs.

The Riouw archipelago, like Siak, was formerly subject to Johore. The native rulers had never forgiven the Portuguese for robbing them of Malacca, and were among the first to welcome the Dutch. This friendship with 'their oldest ally' lasted even after the Dutch ousted the Portuguese from Malacca, but in 1699 the death of the sultan was the occasion of one of the usual disputes over the succession. The Boeginese pirates intervened and placed a nominee on the throne, on the condition that he would appoint their leader as his viceroy. In 1719 the seat of the kingdom was transferred from Johore to Riouw. At length in 1745 the sultan appealed to the Dutch for help in shaking off the Boeginese yoke. No action was taken, however, until 1759, when the Boeginese viceroy seized Selangor, one of the tin-producing areas, declared himself independent, and besieged Malacca. He was defeated and soon afterwards sought reconciliation with the sultan.

Borneo

In the early seventeenth century the Dutch East India Company tried to open up a trade in diamonds through relations with Sambas and Soekadana, the two chief states of west Borneo (Fig. 7). When the English settled in Soekadana in the middle of this century the Dutch again intervened, with the unintended result of strengthening the Boeginese pirates. For a hundred years nothing more was attempted, and all the coastal states remained dependent on the Boeginese. But in 1778 the Dutch recognized as sultan of Pontianak an Arab who had recently founded a state there, and helped him to maintain his position. This attempt to counter the influence of the Boeginese was ineffective and, though in 1788 the sultan of Bantam ceded to the Company his rights of suzerainty over the states along the seaboard, three years later the Dutch abandoned the whole coast, which had never been other than a burden.

South Borneo offered greater attractions to the Dutch because of its pepper. Here they found a powerful native state, the sultanate of

Bandjermasin, which claimed suzerainty over the petty states all along the east coast. The Dutch began trading there in 1603, but four years later the natives attacked a Dutch ship lying at the quay and massacred the whole crew. As a reprisal Bandjermasin was laid waste in 1612, and its sultan took refuge at Martapoera where he founded a new capital. Trade was resumed in 1635, when the sultan gave the Company a monopoly of the pepper trade. As usual, attempts to enforce the monopoly aroused resistance and resentment. In 1638 rebels attacked the Dutch factory at Bandjermasin, and slew all the residents, numbering sixty-four; a month later loyalists massacred some forty Dutch at Kotawaringen. Twenty years later Bandjermasin and Kotawaringen sought for reconciliation and the Dutch resumed trade. In 1660 a new contract was arranged, followed in 1664 by a new grant of the pepper monopoly. In fact, however, most of the pepper went to the English, and in 1669 the Dutch withdrew. When relations were resumed in 1733 the Dutch were stronger and Bandjermasin weaker. Traffic in pepper with the English and Chinese was still rife, and to quash it, the Dutch established a settlement at Bandjermasin, protected by a fort at Tabanio on the coast. Here they remained until the end of the century.

Celebes

On the arrival of the Dutch, Makassar was the main emporium for spices, and had largely taken the place formerly occupied by Ternate. In 1609 the Dutch obtained permission to establish a factory there, but the local merchants soon learned that the newcomers were formidable rivals and when the concession expired in 1618 it was not renewed. Henceforth relations were in general hostile. In proportion as the Dutch gained control over Ternate so did its dependent states come under the influence of the Gowa kingdom with its capital at Makassar; by 1640 it ruled over Manado, and the islands of Boetoeng and Boeroe; the state of Boni paid tribute, and Salajar, Soembawa, and part of the east coast of Borneo were within its sphere of influence (Fig. 7). Over all this area the Dutch claimed a monopoly of trade by virtue of its contract with the former suzerain, Ternate, and the rivalry between the Dutch and Makassar could be settled only by a trial of strength. In this conflict the people of Makassar looked for support, first to the Portuguese and Spaniards, and later to the English.

The local outpost of the Dutch was in Boetoeng, a large island off the south-east coast of Celebes. After a series of minor incidents the

Dutch blockaded Makassar in 1636, but the treaty of peace in the following year made little change in their relations. The Dutch found allies among the dependencies of Makassar, notably Boni, and with their help finally broke the power of Makassar, by forcing it to accept the Bongaya Contract. On this arrangement the Company took possession of Makassar and the adjacent coast and obtained a monopoly over European and Chinese exports. Further, no other Europeans were allowed to trade there. At the same time the states formerly subject to Gowa were required to enter into an alliance with the Dutch, and to accept Dutch arbitration in their mutual disputes. The Contract was originally accepted in 1667 and, after an attempt to break it, confirmed in 1669. This marked the downfall of the Gowa kingdom, though Makassar still remained commercially important.

The Bongaya Contract did not prove wholly to the advantage of the Dutch. Exiles from Makassar stirred up trouble in Bantam and Mataram (see p. 54), and the Boeginese merchants, being shut off from lawful trade, took to piracy, with such effect that for many years they dominated the Riouw archipelago and the land on both sides of the southern entrance to the Malacca strait, as well as the west coast of Borneo (see p. 62). Over the whole of this region strong pirate colonies defied the Dutch. Moreover, Boni, after gaining its independence by help of the Dutch, turned against them, and in 1739 besieged them in Makassar. They were driven off but never effectively subdued and, although the Dutch remained in Makassar, it was for strategic rather than commercial reasons.

The Minahasa region was the only other part of Celebes where the Dutch played an important part. During the first half of the seventeenth century it was harassed by Ternate and the Spaniards, and appealed to the Company for help. In 1657 the Dutch came to its aid and established a post at the capital (Manado), with the result that three years later the Spaniards left for good. Contracts with the local chieftains were arranged in 1679. By this time the claims of Makassar had been settled by the Bongaya Contract, and in 1683 the sultan of Ternate was compelled to forego his pretensions to suzerainty. From that time onwards to the present day, close and friendly relations have been maintained between Minahasa and the Dutch.

Moluccas and the Lesser Soenda islands

The course of events in Amboina, Banda, Ternate and Tidore has been traced in outline up to the evacuation of the Moluccas by the Spaniards in 1663 (see p. 52). After that the sultans were no longer

able to withstand the Dutch and the sultanates lost their importance. Moreover, the French and English began to cultivate spices in their own colonies and, especially during the second half of the eighteenth century, the Dutch monopoly in the Moluccas was of little value.

Ceram was formerly divided between Ternate and Tidore; the western half, held by Ternate, was ceded to the Dutch in 1647, and the eastern half was conquered from Tidore in 1653. The Company succeeded also to the indefinite claims of Ternate and Tidore over Halmahera and the coast line of New Guinea. They further claimed the Aroe and Kai islands in 1606 by right of discovery, and Tanimbar on the same ground in 1639, but they did little to prosecute their claims beyond entering into agreements with the chieftains, which they rarely attempted to enforce.

The Timor archipelago where the Portuguese had many settlements was attractive for its sandalwood. Their headquarters was a fort on Solor, which the Dutch captured in 1613. Thereupon the chieftains on the neighbouring islands and in west Timor joined them in evicting the Portuguese, so that before the end of the year the Dutch were able to establish a post at Koepang. The chieftains were required to accept the Dutch monopoly of trade, but this was so insignificant that it caused no trouble. Here, as elsewhere, Ternate was compelled to abandon its claims in 1683. From time to time the Portuguese in eastern Timor disturbed the peace, but in 1749 an attack on Koepang was defeated with an ease that justified the Dutch in disregarding their hostility. This victory strengthened Dutch prestige and enabled them to insist on more favourable contracts with the chieftains on Timor, Roti, Solor, Soembawa and Sawoe. Soembawa belonged to Gowa, one of the chief states of southern Celebes, until 1667 and in 1674 was forced to accept the Bongaya Contract (see p. 64). It was a part of this arrangement that Lombok should acknowledge both Soembawa and the Company as suzerains, but in fact both Lombok and Bali remained practically independent of Dutch authority.

ADMINISTRATIVE ORGANIZATION UNDER THE DUTCH EAST INDIA COMPANY

Outside Java, the Dutch East India Company made no attempt to exercise control over the people; it left them under the native chieftains, who were entirely independent, except that they had to furnish such products as the Dutch might require. Even in Java, the native chieftains were allowed to rule their people in their own way, though

they were gradually brought under control for the purpose of exacting tribute. Batavia was the headquarters of the Governor-General, who was in immediate control of Java. Outside Java, there were five Governments*: Ternate, Amboina and Banda from 1617; then, as conquered, Malacca and Makassar. At stations where the Company had no territorial possessions, the chief officer was either a Director, Commandant or Opperhoofd; but the representatives in the native states, and subsequently other officers in direct relations with native authorities, came to be known as Residents.

In Java, one of the most difficult problems which the Company had to face was the administration of justice. In respect of Europeans, the chief officer everywhere had civil and criminal jurisdiction; but in respect of the natives the function of all officers was in general, purely commercial. Thus, from the first there was a dual system of administration, with Dutch law for the Europeans and native justice for the people, in separate courts; the Chinese and other foreign orientals were placed under headmen of their own people. Everywhere, as a matter both of convenience and profit, the rule of 'like over like' was adopted.

To this general practice there were two exceptions. Firstly, in Batavia and its environs, there was not only a Supreme Court with jurisdiction over servants of the Company, but also a Court of Aldermen (*Schepenen*) with jurisdiction over other Europeans and also over native and Chinese residents. All these courts administered Dutch law with certain local modifications. Secondly, in Amboina, from very early days, a tribunal under a European president took cognizance of native cases; this was the first native court or *landraad*. From 1746 there was another *landraad* in Semarang, where the governor of north-east Java and a bench of native dignitaries disposed of important cases, chiefly those bearing on the interests of the Company; this court was directed in 1747 to apply native law, so far as consonant with European ideas, and shortly afterwards certain treatises on Muslim and Chinese law were recognized as authoritative. There is mention of a similar court in Cheribon. In the environs of Batavia and the adjacent uplands of Preanger, a Commissioner for Native Affairs gradually acquired extensive powers including judicial authority in certain cases.

To this extent the government exercised direct rule. But that was exceptional. Elsewhere, it ruled indirectly through native dignitaries,

* Outside the East Indies there were three Governments of the Company—Coromandel, Ceylon and the Cape of Good Hope.

known in Java as regents. In the Preanger district, the regents were at the same time both servants of the Company and petty feudal lords; in the coastal districts from Tegal to Besoeki the regents were vassals of the Company, as they had formerly been vassals of Mataram; in Bantam, Cheribon and Madoera, the sultans could boast a fictitious independence; and in Soerakarta and Jogjakarta, the princes, though formally independent, were in subordinate alliance with the Company. Thus, there was a gradation of control from direct rule in Batavia to a loose suzerainty in the native states; but the normal unit of administration was the regency.

The regents had to obey all orders by the resident or other local representative of the Company. From 1706 the Company reserved the right of appointing the subordinate officers of the regent, and in practice ordinarily appointed his chief executive officer, the *buiten-bepatti*. From about 1750, there was a growing tendency to encroach on the judicial and other powers of the regents, but so long as they complied with requirements for supplies, they were left usually to rule as they liked, strong in the support of the Company if their high-handedness should cause unrest. This quasi-feudal nobility administered the possessions of the Company under the supervision of its European servants.

On one side of native life there was a gradual encroachment by the Company. In 1681 the police sergeant at an outpost was charged with supervising the cultivation of produce due to the Company and in course of time this practice was extended. The military and police duties of such officials were overshadowed by their civil functions as overseers (*opzieners*) of produce. During the last quarter of the eighteenth century there were usually three or four of these 'coffee-sergeants' in the Preanger. Before long they began to keep an eye on the general administration of the regents and to report their misdeeds.

By the system of indirect rule the Company was able to evade the responsibilities of sovereignty and to concentrate on making a profit. Its income, as originally conceived, came from trade, but as soon as it gained power, trade gave place to tribute. In the treaty with Mataram in 1677-78 the Soesoehoenan promised to supply 4,000 measures of rice annually at the market price; a little later the sultan of Bantam was required to deliver all the pepper in his realm at a fixed price per pound. About the same time the Preanger regents were required to supply free of cost certain quantities of pepper, indigo and cotton yarn. Thus arose the system of taxation by Forced Deliveries and Contingencies. Forced Deliveries were payments in

kind made under compulsion, but nominally on an economic basis; they were tribute disguised as trade. Contingencies were tribute undisguised, except that the payments were made in kind and not in cash. In practice, however, there was no distinction between these two forms of revenue, which together formed the bulk of the Company's income. Among other sources, the most lucrative was the farming of tolls and lands, mainly to the Chinese. The natives were also liable to render compulsory services, which may be regarded as taxation in labour instead of in money. The comparatively small amount of revenue collected in money came mostly from Europeans, who alone were subject to direct money taxes and were the chief contributors under most heads of indirect taxation. The general rule was that the Europeans paid taxes, and the natives furnished produce or personal service.

DISSOLUTION OF THE DUTCH EAST INDIA COMPANY

The Dutch East India Company was a posthumous child of the sixteenth century, when the merchant adventurer went armed and trade in foreign seas was inseparable from war. It grew up in the seventeenth century, the age of mercantilism, and in 1693 its profits reached a maximum. Its prosperity continued during the eighteenth century, though there was a change in the character of its trade. Spices, other than pepper, declined in importance; coffee, one of the crops introduced by the Dutch, and tea were the chief exports. There were also considerable exports of sugar and indigo from Java and of camphor and cutch from the Outer Provinces. The trade in China tea was as large as that in coffee, if not larger. The imports were cloth from Coromandel, porcelain from China, and European goods for the Company and its servants. The native market was neglected, partly because the ships were few and small and had no cargo space for cheap goods.* Despite the continuance of its trade the profits of the Company declined. In the last half of the eighteenth century it seemed outwardly as strong as ever; dividends were still paid regularly and the shares were more than double their face value. But inwardly it was rotten. The dividends were being paid out of capital or loans, while the servants of the Company were waxing rich. From top to bottom corruption was rampant. In the accounts no distinction

* The vessels of the Company sailed in fleets, usually three a year. From 1602-25 the number averaged ten; from 1625-70 the average was twenty-two and from 1670-1750 it was twenty-nine. From 1750-80 the average number fell to twenty-six, but the ships were larger and mostly over 1,000 tons.

was drawn between the political and commercial charges, and the defective system of accountancy concealed both the corruption and the loss that it occasioned.

From 1770 onwards the Company was threatened with bankruptcy and on the outbreak of war with England in 1781 its position became so critical that one of the six Chambers, that of Amsterdam, had to ask for help from the Netherlands government. The debt increased annually and in 1783 the Company ceased to pay dividends. In 1790 the State, now the chief creditor, appointed a committee to recommend what course should be adopted. Recovery still seemed not impossible until the wars of the French Revolution struck a fresh blow at trade. In 1792, the Jacobins declared war on the United Provinces and their invasion of the country in 1795 was the occasion for a revolution which gave power to a National Assembly, forming the Batavian Republic. Under the new constitution the State was to take over all the possessions of the Dutch East India Company and in 1798 the Company was dissolved.

BIBLIOGRAPHICAL NOTE

1. The following general works on the history of the Netherlands Indies will be found useful: H. T. Colenbrander, *Koloniale Geschiedenis*, 3 vols. (The Hague, 1925); E. S. Klerck, *History of the Netherlands East Indies*, 2 vols. (Rotterdam, 1938); F. W. Stapel, *Geschiedenis van Nederlandsch-Indië* (The Hague, 1930); Bernard H. M. Vlekke, *Nusantara. A History of the East Indian Archipelago* (Cambridge, Mass., 1943).
2. The classic work on Hindu influence in the East Indies and on Hindu-Javanese civilization is N. J. Krom, *Hindoe-Javansche Geschiedenis* (The Hague, 1926). For a short survey in English of the main features of this period see J. S. Furnivall, 'The Early History of the Malay Archipelago' *Journal of the Burma Research Society* (Rangoon, 1934), and W. F. Stutterheim, *Indian Influences in the Lands of the Pacific* (Weltervereden, 1929).
3. The activities of the Portuguese in the East Indies are described in F. C. Danvers, *The Portuguese in India* (London, 1884) and in E. Prestage, *The Portuguese Pioneers* (London, 1933).
4. On the history of the Dutch East India Company see S. van Brakel, *De Hollandsche Handels-compagnieën der zeventiende eeuw* (The Hague, 1908); P. van Dam, *Beschryvinge van de Oost-Indische Compagnie*, ed. F. W. Stapel (The Hague, 1927-39); W. M. Mansvelt, *Rechtsvorm en geldelijk beheer bij de Oost Indische Compagnie* (Amsterdam, 1922).
5. The letters and reports of Jan Pieterszoon Coen are published in H. T. Colenbrander, *Jan Pieterszoon Coen, Beschieden omtrent zijn bedrijf in Indië*, 5 vols. (The Hague, 1919-23).
6. On the foundation and development of Batavia the most valuable work is F. de Haan, *Oud Batavia*, 2 vols. (Bandoeng, 1935).
7. The history of the Protestant missions is described in J. Mooy, *Geschiedenis de Protestantsche Kerk in Nederlandsch-Indië* (Batavia, 1923-31).

Chapter III

HISTORICAL OUTLINE, 1800-1939

Introduction: Colonial Policy of the Batavian Republic, 1795-1806: Administration of the East Indies under Daendels, 1806-10: British Rule under Raffles, 1811-16: Restoration of Dutch Rule in Java, 1816-24: Dutch Rule in the Outer Provinces, 1816-24: The Anglo-Dutch Treaty of 1824: The Java War, 1825-30: Java in the period 1830-70: The Outer Provinces in the period 1830-70: The East Indies under the Liberal System, 1870-1900: The Subjugation of Atjeh, 1873-1900: Political Events in the Outer Provinces, 1900-10: Growth of Nationalism, 1900-14: Administrative Changes, 1900-39: Growth of Political Parties and of Nationalist Movements, 1914-39: Relations with Japan, 1918-39: Bibliographical Note

INTRODUCTION

The dissolution of the Dutch East India Company in 1798 is an important dividing line in the history of the East Indies. Since the end of the seventeenth century the Dutch East India Company held a virtual monopoly in the archipelago, having successfully overcome its Portuguese, French and English rivals. The outbreak of the French Revolutionary Wars disrupted European commerce and led to the downfall of the Company already weakened by corruption, and in 1798 the whole of its possessions and capital were handed over to the government of the Netherlands. From the beginning of the nineteenth century till the present day the East Indies have formed a part of the empire of the Netherlands and their development has been in the interests partly of the State and partly of the native population, rather than in the interests of any single private commercial enterprise.

COLONIAL POLICY OF THE BATAVIAN REPUBLIC, 1795-1806

On the collapse of the Dutch East India Company the administration of Dutch affairs in the East was entrusted to a council for Asiatic affairs. The transfer of sovereignty to the State called for new methods of administration. At first the problem was treated wholly as one of trade, and the general opinion was that the East Indies should be managed for the profit of the State, as formerly it had been managed for the profit of the Company. But this view was sharply challenged by two schools of thought imbued with the new

French doctrines of government; the one accepted the liberal principles of the French Revolution, the other admired the enlightened authoritarianism of Napoleon. The chief exponent of revolutionary liberalism was Dirk van Hogendorp, a servant of the Company who had studied British rule in India and looked on England as a model of colonial policy. In a series of forceful pamphlets he placed the colonial problem in a new light; hitherto, it had been regarded as one of commerce, how trade should be conducted, but Van Hogendorp made it a question of government, how the country should be ruled. All parties were agreed that the aim of colonial rule should be to obtain the greatest profit for the homeland; Van Hogendorp differed from his seniors in urging that this would accrue from governing the country in accordance with the principles of the French Revolution. These principles implied the substitution of direct rule, such as had recently been introduced into British India, for indirect rule, which had always been the practice of the Dutch. In 1802 the Dutch government appointed a committee to examine the question and named Van Hogendorp as one of the members. The president of the committee, Nederburgh, and most of the members, however, held conservative views and Van Hogendorp failed to convince them of the benefits to be derived from direct rule. In its report, submitted in 1803, the committee laid down the principles of indirect rule through a native aristocracy under European supervision, and of control over the executive by an independent judiciary. This report formed the basis of a series of 'charters' promulgated by successive governments under the numerous ephemeral constitutions of the short-lived Batavian Republic; but no government lived long enough to give effect to its reforms. Meanwhile conditions in Asia were changing for the worse. The interruption of normal relations with Europe precluded supervision by the home government, and the local officials became still more arbitrary and corrupt than under the Company.

The report submitted in 1803 dealt primarily with problems relating to Java, for by this time nearly all other Dutch territories in the East Indies had been lost to the British. When William V, the last Stadtholder, took refuge in England in 1795, he ordered his colonial governors to welcome English troops and merchant ships. The governor of Malacca admitted the English, and Padang, which the French had sacked and left almost derelict in 1793, surrendered in 1795. In the following year the English occupied Amboina and Banda without opposition, and Ternate surrendered in 1799.

Although by the treaty of Amiens in 1802 all these posts were to be restored, the renewal of the war again placed the Dutch possessions at the disposal of the English. Java remained in a state of semi-independence for, though to a large extent cut off from contact with the home country, it was not occupied by the English, since the local Dutch government wisely refrained from any active support of the French cause. The trade of the island prospered in this period for, freed from strict supervision of the home government, the Dutch in Java were able to enter into commercial relations with neutral countries, particularly Denmark and the United States. This period of semi-independence ended with the appointment of Herman Willem Daendels as Governor-General in 1806.

ADMINISTRATION OF THE EAST INDIES UNDER DAENDELS, 1806-10

When Louis Bonaparte became king of Holland in 1806, he drew up a project of reforms for the execution of which he picked on Daendels, formerly a leader of the Dutch Jacobins and now a fervent admirer of the authoritarian methods of Bonaparte. Efficiency was the object of his policy and indirect rule was repugnant to him as inefficient. He therefore divided up the whole area under Dutch rule into ten prefectures, to be administered by official civil servants, except one that was placed under the Forest Department. The European officials were no longer graded as merchants, and native officials ceased to be territorial dignitaries, though they drew no official pay and still drew their emoluments from the land and the people. In each prefecture there was a European officer as prefect, with the regents as his subordinates. Daendels introduced for the first time a regular judiciary, constituting in each prefecture a native court with the prefect as chairman of a bench of regents. He also sought to reduce the influence of the Chinese by the resumption of lands mortgaged to them.

All these reforms were jeopardised by the necessity of putting Java in a state of defence against the British. Daendels was obliged to undertake extensive public works on harbours, forts and roads, and one of his greatest achievements was the construction of a grand trunk road along the whole northern coast. He also moved the residential quarters of Batavia to the suburb of Weltevreden and constructed a fortified camp at Meester Cornelis. As the Dutch were cut off by the British fleet from markets where they could sell

their produce, there was no money to pay for the construction of these works. Despite his distrust of Chinese influence, Daendels was obliged, therefore, to sell land to the Chinese on an unprecedented scale. Although he disliked compulsory cultivation, the need for produce which he hoped to sell made him enforce the cultivation of cotton in the plains and of coffee in the hills.

The extensive use of labour on public works occasioned serious difficulties. In Bantam Daendels required the sultan to provide labour for improving the defences, but the work was so laborious and unhealthy that many died and the sultan urged a relaxation of the demands for workmen. When this was not granted the Dutch Resident in Bantam was assassinated and armed force had to be used to quell the revolt.

The arbitrary methods of Daendels in dealing with both Dutch and Javanese caused widespread resentment. In Bantam and Cheribon, as in the native states of Soerakarta and Jogjakarta, he rigorously insisted on the absolute subservience of the native princes to his authority, whereas under the Company these dignitaries had been accorded a fair degree of local power. In respect of his own officials he was no less high-handed, deporting a former Resident and arresting several high officials without reporting his action to the home government. Quite apart from his dictatorial methods, the reforms introduced by Daendels were unpalatable to many influential men in Holland, and shortly after Napoleon Bonaparte annexed the Netherlands to the French empire in 1810 he was replaced by Jan Willem Janssens, a man of more moderate character. The new Governor-General had a short tenure of office, for in the following year Java and other Dutch possessions in the Indies came under British occupation.

BRITISH RULE UNDER RAFFLES, 1811-16

For some time past, Lord Minto, the Governor-General of India, had been considering the occupation of Java, which action was also being urged upon him by Thomas Stamford Raffles, Agent to the Bengal government at Malacca. In 1811, the Board of Directors of the English East India Company and the British government, with some reluctance, sanctioned a joint expedition. When Janssens relieved Daendels, the expedition was on the point of sailing and in August 1811, Raffles landed near Batavia, with some 9,000 men. The total Dutch forces in Java were certainly more numerous, but

they lacked equipment and arms. No serious resistance was offered to the occupation of Batavia. Janssens, with a bare remnant of his army, effected a withdrawal to the centre of the island, where he was joined by the rulers of Soerakarta and Jogjakarta, still disaffected and resentful of Dutch policy under Daendels. On 11 September, Janssens was forced to surrender and the campaign ended.

With the capitulation of the Dutch in 1811, Java and its dependencies of Palembang, Makassar and Timor became British territory. As Malacca and the west coast of Sumatra had remained under British control since the first conquest in 1796 and as the Moluccas had been reoccupied by them in 1810, the British held control of the whole archipelago. The English East India Company divided their new possessions into four administrative units, the Governments of Java, Malacca, Benkoelen (West Sumatra) and the Moluccas. Lord Minto entrusted the management of affairs in the East Indies to Raffles, who received the rank of Lieutenant-Governor. Although Raffles carried out important work in the Outer Provinces, particularly in reducing the slave trade and in countering the activities of the Boeginese pirates, his main achievement was the reorganization of the administration in Java.

In Java, Raffles, as Lieutenant-Governor, was assisted by a council of three officers, consisting of an English soldier, Colonel Gillespie, and two prominent Dutchmen, Muntinghe and Cransen. Although most of the Dutch inclined to France, there was a strong party favouring the British and at the head of these was Muntinghe, the ablest Dutch official of his time. Raffles had much in common with both Van Hogendorp and Daendels. Superficially his policy resembled that of Van Hogendorp; but whereas Van Hogendorp looked primarily to the interests of the Dutch, Raffles claimed to give first place to the interests of the natives. This difference of policy reflected a difference in the economic relations of Dutch and British in the East. The Dutch had no manufactures, and their sole interest lay in obtaining tropical produce as cheaply as possible. But the British since the Industrial Revolution could sell their cotton goods in Asia at a lower rate than those of local manufacture; their interest lay therefore in promoting native welfare so as to be able to sell as much as possible. Raffles was too shrewd to overlook this, but he had a genuine affection for the Malays, whom he thought 'fresher from the hand of Nature' than the peoples of British India, and he demonstrated this kindly sentiment by a keen interest in their history and language at a time when these were wholly neglected by the Dutch.

On the other hand Raffles shared the passion for efficiency which had inspired Daendels, to whom he gave credit for introducing 'a much more regular, active, pure and efficient administration than ever existed before'; but he rose far above Daendels in his intimate knowledge of the East and, with a much wider range of vision, enjoyed in a supreme degree the gifts of charm and sympathy which Daendels lacked.

The Dutch system of indirect rule rested on the principle of authority, as was necessary if they were to obtain produce cheaply by requiring the native to grow export crops under compulsion. Raffles, as a disciple of Adam Smith, believed in equality before the law and in freedom from government control over person, property and trade; this plan accorded best with the prosperity of British commerce. His policy was to substitute paid for compulsory services, and to leave the cultivator free to grow whatever crops might be most profitable. On this plan the regents were no longer needed as agents of compulsion, and the exercise of their authority on Eastern lines prejudiced the introduction of a new system based on Western principles. Raffles believed therefore in direct rule, and was fortunate in finding that Daendels had already moved in this direction. Again, his system of direct rule implied immediate relations between the government and the cultivator, and, therefore, the introduction of a land tax such as had been advocated by Van Hogendorp. On both these cardinal features of his reforms he could appeal to Dutch precedent.

In territorial administration Raffles elaborated the machinery which Daendels had invented. He took over the prefectures, but substituted the term 'residency', and raised the number to sixteen, partly by a readjustment of the former divisions, and partly by resuming tracts that Daendels had alienated to the Chinese. Daendels, while converting the regents into government officials, had retained the regencies; but Raffles termed these 'districts', and the regents became merely district officers. Further, in order to bring the government into still closer contact with the people, he partitioned the districts into police tracts or divisions under a divisional officer, with a headman in each village. In his relations with the native states Raffles continued the policy of Daendels in restricting their powers to a minimum. He annexed the sultanates of Bantam and Cheribon and limited the power of Jogjakarta by establishing a second principality within its borders, in the same way as since 1757 a small territory had been held as a fief by the Mangkoe Negoro in the state of

Soerakarta. In all administrative affairs both states had to comply with the wishes of the British government.

In his judicial reforms Raffles followed the liberal principle of uniformity of law for all classes. By reducing and redistributing the judges, he was able to provide a more efficient judicial organization in the towns at little or no extra cost; in the interior, he invested the Resident, sitting alone or with assessors, with the judicial powers formerly exercised by the prefect and a judicial bench; petty matters, which had formerly been left to the discretion of the regent applying native customary law, were systematically distributed between the district officer, divisional officer and village headman, with graduated powers.

Alongside this completion of the reforms of Daendels, Raffles applied the principles of Van Hogendorp, by conferring on the cultivators private property in land and by substituting paid for compulsory labour. One of his earliest measures was to institute an enquiry into land tenures. From this enquiry he drew the conclusion that all land was the property of the State and liable, therefore, to pay rent to the government. He gave directions accordingly that the land should be graded with reference to its productivity, and assessed proportionally, either by villages or by individual holdings. For the assessment of the land he employed the Resident or, so far as possible, a special Collector. The land-rent was collected by the village headman under the supervision of the divisional officer and the Resident.

The enquiry into land tenures also led Raffles to the conclusion that the head inhabitant of a Javanese village had 'from time immemorial been considered to have vested in him the general supervision of the affairs relating to the village, whether in attending to the police, settling the minor disputes that occur within its limits, or of collecting its revenues or more often its services'. Another discovery was that the office of headman 'had been elective, and the powers entrusted to him by his fellow-villagers'. This was his great permanent contribution to the administrative system of Java. The discovery of the elective headman, at once agent of the government and representative of the people, was extraordinarily happy, for it supplied Raffles with an instrument for building up a strong administrative system without depending on the regents, whom he distrusted as not only rapacious and oppressive, but also pro-Dutch. This idea of using the village as a unit of administration must have been familiar to Raffles from the practice of British India, and the

device, although novel to the Dutch, impressed them so favourably that it has ever since remained an essential feature of Dutch rule.

The all-embracing activities of Raffles extended to every branch of the administration, and everywhere he introduced new and more business-like methods. He laid the foundations of modern arrangements for exploiting the tin mines; he substituted direct management for the farming out of customs revenue and salt revenue to the Chinese and, on the other hand, farmed out to the Chinese the pawnshops which had previously been managed by the government; he endeavoured likewise to abolish the onerous restrictions which tolls and transport duties laid on trade in the interior, and placed relations with the surviving native states on a new footing which left them merely the shadow of autonomy. In these, as in all other matters, the Dutch system has never been quite the same since it was cross-fertilised with the ideas of Raffles.

The services of Raffles to colonial administration were not adequately appreciated in England, either by the Directors of the East India Company or by the British government. The Directors noted that his policy in Java had not been financially successful; the British government had little sympathy with his vehement and repeated protests against the restoration of the islands to the Dutch, which was part of their general policy of building up the Netherlands as a strong barrier to French ambition. He was, therefore, recalled, and in March 1816 was relieved by John Fendall.

RESTORATION OF DUTCH RULE IN JAVA, 1816-24

Two years before Raffles was relieved of his post as Lieutenant-Governor, the Convention of London, between Great Britain and the Netherlands, had stipulated that the Dutch should recover all the colonial possessions in the Far East which they had held in 1803. Owing to the return of Napoleon from Elba, the commissioners sent out to assume charge on behalf of the Netherlands did not arrive until August 1816. Meanwhile Raffles had already been relieved in March of this year, but his successor, John Fendall, showed no disposition to make things easy for the Dutch. The Convention clearly left the English in Penang, and in Benkoelen, with its dependencies, Tapanoeli, Natal and Nias, but with respect to Dutch claims it allowed of contrary interpretations. One view, taken by the British, was that in 1803 the Dutch outside Java had held no more than their settlements along the coast and that the

interior was therefore open to the British. On the other hand, the Dutch claimed possession of the interior by virtue of their contracts with the local chieftains. Friction was especially acute over Borneo and Billiton, and in Palembang and Padang. The return of Raffles as Lieutenant-Governor of Benkoelen in the beginning of 1818 added to the troubles of the Dutch. Finally, however, the Dutch claims were allowed, although it was not until May 1819 that they regained possession of Padang. By that time Raffles was already in Singapore, where, braving Dutch opposition, he had hoisted the British flag in February. This created a new situation in the archipelago, leading to a comprehensive settlement of British and Dutch claims in a treaty concluded in 1824 (see pp. 82-3).

The controversy regarding the best system of administration had not yet been settled when Java was restored to the Dutch in 1816. The King of the Netherlands, William I, decided that a liberal policy should be applied under his direct control, and sent out three commissioners-general to introduce it. One of these was Baron van der Capellen, who later became Governor-General. On their arrival they found that Raffles had introduced a system even more liberal than that contemplated in their instructions. The main question was whether they should maintain the system of taxation introduced by Raffles or revert to the traditional Dutch system of tribute. There were general complaints about the inequitable incidence of land-rent, but it had the powerful support of Muntinghe, their chief adviser, and, after long and careful enquiries, the commissioners accepted his advice. The retention of land-rent involved the adoption of the administrative machinery invented by Raffles, with its territorial organization of residencies subdivided into regencies and villages. On the other hand, while retaining the machinery of Raffles, the commissioners aimed at working it on traditional Dutch lines through local native chieftains, and tried to enhance the dignity of the regent in Java by directing the resident to treat him as a 'younger brother', the term ordinarily used to express the relation of a vassal to his overlord. In judicial affairs also they reverted to the Dutch tradition of 'like over like', with separate courts and different law for each main division of the people, Europeans, Natives, and Foreign Orientals. These, and other minor reforms, were embodied in the Constitutional Regulation (*Regeringsreglement*) of 1818, and in January 1819 the commissioners made over their charge to Baron van der Capellen as Governor-General.

The system of leaving trade free and depending on taxation for

revenue placed the trade in the hands of the British and left the Dutch with insufficient revenues to pay their way. Muntinghe had foreseen this, and had always urged that the break with the old system of state trading should be gradual. Raffles had not been able to make Java pay its way. The Dutch set up a more costly establishment, and at the same time had to suppress unrest all over the archipelago. Muntinghe, who was on leave in Europe in 1824, explained the situation to the king, and obtained his approval for the foundation of a large trading company which should consolidate Dutch interests and thus be able to compete with the British merchants. This was the origin of the *Nederlandsche Handels Maatschappij* (N.H.M.), the Netherlands Trading Company, constituted in 1825.

The remedy, however, came too late. Van der Capellen, in his urgent need of funds, had been compelled to mortgage all the Dutch possessions in the East to a firm of British merchants in Calcutta. The king refused to sanction this, and sent out a special Commissioner-General, Count du Bus de Gisignies, to replace Van der Capellen and take any measures that he thought necessary to place the colony on a profitable basis. Muntinghe had looked to develop Java through native cultivators; du Bus preferred to trust to foreign capital. He drew up a scheme for colonising Java 'not with men but with capital', and in 1828 succeeded in founding the Java Bank, which together with the N.H.M. has ever since remained the basis of Dutch economic power in the Netherlands Indies. At the time, however, it failed to attract outside capital and practically the whole was subscribed by the government and the N.H.M., itself largely a government institution. Meanwhile the political and financial situation had been aggravated by a serious rebellion which broke out in Java in 1825.

DUTCH RULE IN THE OUTER PROVINCES, 1816-24

Outside Java, the Dutch paid little attention to any of their possessions in the archipelago, except Sumatra, and even here they were chiefly concerned to counter the activities of Raffles. The alternation of Dutch and British power in the archipelago engendered unrest among the native chieftains, which was aggravated by the discord between Dutch and British regarding their respective rights. After the return of Raffles to Sumatra in 1818, the friction there became so acute as to lead to military operations.

Sumatra

In western Sumatra the restoration of Padang was delayed by the trouble between the Padri, a group of Muslim reformers, and the conservative party, which included the members of the former royal house. Some of these took refuge in Padang, which under British rule was subordinate to Benkoelen. Although it was more than a century since the Menangkabau princes had exercised any real authority, Raffles, on taking over charge at Benkoelen, thought to use them as an instrument for extending British rule. He therefore espoused the cause of the refugees and stationed an armed post of a hundred men at Semawang, to protect the loyal population against the Padri. His action was disavowed by the Government of India and he had to withdraw the post. In May 1819 Padang was restored to the Dutch.

As the Padri were continually gaining ground the Dutch were apprehensive lest they should find support from the British in Natal. Accordingly in 1820, when the princes offered to surrender all their territories in return for protection against the Padri, their offer was accepted and the former post at Semawang reoccupied. This was the first incident in the long-drawn Padri War. For some years the Dutch maintained their hold on the interior, although they made no headway, but in 1825 with the outbreak of the Java War the Padri regained the ascendancy.

In Palembang the Dutch on their return found power divided between the nominal sultan and his predecessor, whom Raffles had deposed in 1812. They tried to settle the dispute by allotting to each rival a patch of territory for his court, and annexing the remainder of the kingdom. Not unnaturally, both rivals disapproved of this settlement. The younger brother turned for help to Raffles who despatched a column from Benkoelen. After defeating this column the Dutch banished the younger brother to Java and his territory was transferred to his rival, who, however, turned against the Dutch in the middle of 1819 and forced them to abandon their post in Palembang. In 1821 they defeated the sultan and two years later he surrendered to the Dutch all his sovereign rights in return for a monetary compensation.

The man whom Raffles recognized as sultan of Palembang in 1811 ceded Bangka and Billiton to the British. The Convention of London, 1814, provided for the exchange of Bangka for Cochin, but made no reference to Billiton, which remained, therefore, a subject of dispute between the Dutch and the British. In Bangka, the sultan of Palembang had a strong following and, when he turned the Dutch out of

Palembang in 1819, there was an insurrection which took over two years to quell. In Billiton there was less trouble from the people, but the dispute as to its ownership lasted until 1821, when the Dutch claims were provisionally allowed pending a final settlement.

Along the east coast of Sumatra the chief source of friction was Riouw, where the sultan was still overlord of Riouw and Johore, with a Boeginese pirate chieftain as his viceroy. In 1818, Raffles concluded a treaty of friendship with the sultan; in the following year he acquired Singapore island from the sultan and founded a British settlement there.

At the end of 1818 Raffles on his way to Singapore had contemplated the establishment of a post at Atjeh, but in deference to objections raised by the governor of Penang he passed on southwards without calling at Atjeh. After the acquisition of Singapore, however, the British made a treaty with Atjeh, giving them preferential rights in trade.

Borneo

The Dutch claims to Borneo were not finally admitted until after 1816, for, since Daendels in 1809 had sold all the Dutch rights, Fendall was reluctant to recognize their title to the island until expressly ordered to do so by the British government in India. When the Dutch finally took over, the rulers of the native states of Pontianak, Sambas and Bandjermasin sought their protection against the Boeginese pirates who were harrying the coast and against the groups of Chinese mining colonies which were a disturbing element in the interior. In 1818, the Dutch sent a few hundred soldiers to garrison certain outposts, but their strength was insufficient and the Dutch representatives were incompetent. The position grew worse, and the Chinese more unmanageable. Then in 1825 the Dutch had to leave the Chinese in possession as all their troops were needed for the Java War. The Boeginese pirates were similarly left a free hand in the coastal waters.

Celebes

In south Celebes, the ruler of Boni, who had stood out against the British, was no better inclined to welcome back the Dutch. By 1824 Dutch rule was merely nominal, and there remained a choice either to abandon this part of the island or to restore the authority of the Dutch by force of arms. By an expedition in 1825, they managed to recover the same position which they had held in 1669 (see p. 64). Boni was defeated but not subjugated. Further operations were

prevented by the outbreak in that year of the Java War and Boni remained practically independent. In Manado, however, the Dutch were welcomed as old friends.

Moluccas

When the Moluccas were restored to the Dutch in 1817 the people were indisposed, after two hundred years of oppression, to submit quietly to the transfer. The immediate consequence was a serious insurrection in Saparoea, one of the Oeliassers, which soon spread to Amboina, and some months elapsed before order was restored.

Lesser Soenda islands

Although Raffles had reduced the princes of Bali to submission, both Bali and Lombok regained their independence on the restoration of Dutch rule. In Timor the Dutch ejected the Portuguese from the district in the western part of the island upon which they had encroached during the time of the British occupation. Apart from this incident all the islands in this group, though nominally Dutch possessions, were neglected.

THE ANGLO-DUTCH TREATY OF 1824

Although the Dutch showed little interest in the Outer Provinces, they wanted to make good their claims and especially to prevent any further incidents such as the occupation of Singapore. The British on their side wanted to develop their trade and found that, even in Java under Dutch rule, they were able to cut out the Dutch merchants. With stations at Penang and Singapore they held a strong position along the main route to the East and it would be even stronger if they could obtain Malacca; Benkoelen and their posts on the south coast of Sumatra, however, were of little value if they did not want to use the Soenda strait. These were the essential factors in the prolonged negotiations which arose out of the occupation of Singapore and ended in 1824 with a new treaty.

The treaty concluded in London in 1824 between the Netherlands and Great Britain settled the political and commercial relations of the two powers in the East Indies. On the commercial side it provided that the ships and subjects of either nation calling at ports belonging to the other should not pay more than double the duty charged to nationals, or more than six per cent where the nationals paid no duty; that there should be mutual communication of treaties made with native governments; and that no such treaty should aim at excluding

the trade of the other contracting power. In respect of political relations, the treaty provided for the surrender by the Dutch of their ports in India, of Malacca, and of all settlements in the Malay Peninsula; the British in return surrendered all their settlements in Sumatra, and undertook to make no further settlements south of Singapore; the British were confirmed in their possession of Singapore and the Dutch in their possession of Billiton; further, by an additional note appended to the treaty, the Dutch undertook to respect the independence of Atjeh. The treaty also provided that, if either party should relinquish settlements in Sumatra or in the Malay Peninsula, its rights should devolve on the other party. Although the exact terms of this agreement were often called in question, it formed the basis of the relations between the two powers for close on fifty years.

THE JAVA WAR, 1825-30

Almost immediately after the adjustment of their relations with the British in the Outer Provinces, the Dutch were called upon to face a serious situation in Java. For some time trouble had been brewing in the native states. In 1822 the accession as sultan of Jogjakarta of the great-grandson of the man banished by Raffles in 1812 was a grievous disappointment to his uncle Dipo Negoro, who had hoped for the recognition of his own not very substantial claims. From that time onwards he was a centre of disaffection both at court and in the country. The general disaffection had a substantial basis in the heavy demands, legitimate and illegitimate, made by the native and European governments and by native and European officials for their private interest. One notorious abuse was the farming out of tolls to the Chinese. In 1824 the government arranged to forego these in return for the cession of certain districts belonging to the native states, and thereby united against them all who drew their incomes from these districts. The most serious trouble arose out of the cancellation of leases granted to private adventurers. The rulers of the native states had always rewarded their followers by granting them estates. It had long been the practice for those who held these 'appanages' to raise money by mortgaging them, and, since the restoration of Dutch rule, many Europeans had obtained leases of such lands. For many reasons this practice was objectionable: the produce of these estates spoiled the market for produce belonging to the government; European officials had a long-standing prejudice against private European enterprise in the interior; the

lessees oppressed their tenantry; and it was impossible to prevent European officials obtaining leases for themselves. Van der Capellen decided to put an end to all this. He directed that all leases should be resumed, and the money paid for such concessions refunded. This of course had long been spent, and the result of his orders was that the planters lost their money, the local grandees lost their source of income, and the native rulers lost prestige. In order to provide the necessary funds for compensating the planters, the government proposed to advance them on the mortgage of territories belonging to the native states. The proposal was regarded as a provisional annexation, and this suspicion deepened when in 1825 the government had insufficient means to redeem its undertaking.

Dipo Negoro seized the opportunity to rebel, and was encouraged by the Soesoehoenan of Soerakarta. The latter drew back on the arrival of the Dutch forces, and the two lesser princes, Mangkoe Negoro and Pakoe Alam, held firmly to the Dutch. Dipo Negoro proclaimed himself sultan, and the rebellion spread from Jogjakarta over the greater part of central Java. Until 1827 the Dutch position was critical, but after that it gradually improved and by 1830 Dipo Negoro was compelled to surrender and was banished to Manado. At the ensuing settlement both Soerakarta and Jogjakarta were reduced to their present territories.

JAVA IN THE PERIOD 1830-70

The Culture System, 1830-50

When the State took over the affairs of the Dutch East India Company the debts of the Company amounted to f 134.7 million. Neither the plan of encouraging native cultivation advocated by Muntinghe, nor the encouragement by du Bus of capitalist enterprise brought relief from the burden of debt and the Java War added greatly to the cost of government. At the same time the home government was getting more deeply into debt and by 1830 the financial situation was critical both at home and in the East. At this juncture Johannes van den Bosch put forward a new plan based on the former system of the Company. He proposed that the cultivators, instead of paying taxes in money, should be required to devote part of their land to the cultivation of export crops for the government. The king approved this project and sent Van den Bosch as Governor-General to introduce it.

The Culture System, as it was called, was part of a comprehensive

plan to develop commerce, shipping and industry in the Netherlands. Coffee, sugar and indigo were the main products developed under the System. The produce collected from the cultivators was consigned to Europe by the N.H.M. (see p. 79) and sold, on behalf of the government, in Amsterdam; the proceeds of the auctions were invested in Dutch manufactures which were exported for sale to the natives. There was a rapid development of the Dutch mercantile marine; Amsterdam became the chief market in Europe for coffee and sugar; and a new and important industry sprang up in the manufacture of cotton goods. The fiscal results were so satisfactory that the outstanding debts were wiped off and Java was able to contribute to the Dutch treasury.

The administrative results of the Culture System were less satisfactory. It converted the civil administration into a machinery for making commercial profits, and was not only liable to serious abuse, but was in some ways inefficient. In form the administrative framework devised by Daendels and Raffles was retained. The resident and one or more assistant-residents were linked up with the native staff by an inspector, representing the *opziener* or 'coffee-sergeant' of earlier days and charged with the supervision or inspection of the native officers. These comprised the regent with his assistants, working through the village headman. All the officials, European and native, drew a commission on the produce of their charges; the European officers tended to become commercial agents and the regents regained their former position as hereditary chieftains, exercising their authority without question so long as they furnished the stipulated produce. The demands for compulsory labour disorganized village life and the possession of land was so burdensome that much of it became village land because no one wished to hold it.

The Transition to Liberalism, 1850-70

While the Culture System was annually paying vast sums to the Dutch treasury out of its commercial profits, it was also enriching a growing class of merchants and manufacturers in the Netherlands who gradually came to demand a larger say in political and financial matters in the Netherlands, and, subsequently, in the East. At the same time a number of influential Dutchmen were advocating that the government in the East Indies should pay more attention to the welfare of the native peoples. W. R. van Hoevell and Eduard Douwes Dekker were the most prominent of these reformers; both en-

countered opposition from the government of the Indies and both published numerous books and articles on their return to the Netherlands. The most widely circulated of the books by Dekker was his *Max Havelaar*, written under the pseudonym of 'Multatuli'.

As one outcome of the revolutionary wave that spread over Europe in 1848, the Liberals came into power; this was the prelude to a new constitution for the Netherlands Indies, the first to be enacted by the States-General. This new constitution, the *Regerings-reglement* of 1854, took over the existing administrative machinery with little change of form. The government of the Indies was entrusted to a Governor-General with a council, the *Raad van Indië*, in some matters sharing his responsibility and in others merely advisory. Provision was made for the constitution of departments to manage various branches of the administration. The judiciary was to be independent of the executive. In the territorial administration the dual system was retained. There was to be a European civil service, comprising the residents and their subordinates; but the natives as before were to be left under their 'appointed or recognized heads', and the right of managing their own affairs and electing their own headmen was guaranteed to the village communities. Since 1815 the Crown had always stood above the law, but this would no longer be permissible. Thus, in principle, the Constitution of 1854 made a final break with the older system resting on authority.

On many points, however, the break with the past was by no means definite. Some of these were left to be settled by 'general regulations' (*algemeene verordeningen*), which comprised not only laws (enactments of the legislature), but also royal decrees (acts of the Crown) and ordinances (acts of the Governor-General, with or without his council). The matters chiefly in issue were parliamentary control over colonial finances, and the substitution of private enterprise for State cultivation. The first was settled in 1864 when the Accounts Law (*Comptabiliteitswet*) provided that the budget should be passed annually by the States-General.

From 1862 onwards the State gradually withdrew from cultivation of the less important crops, and the Sugar Law of 1870 provided for the relinquishment of the cultivation of sugar in twelve annual instalments beginning from 1878; coffee was still grown for the government, but merely for revenue, until a further enactment of 1915 put an end to this arrangement in 1919. In 1870 also the Agrarian Law placed private enterprise on a secure basis by enabling capitalists to obtain land from the government or from the natives.

THE OUTER PROVINCES IN THE PERIOD 1830-70

In this period, as for over a century previously, the Outer Provinces were largely neglected by the Dutch and the government interfered in native affairs only when their sovereignty was seriously in jeopardy. The great contrast in economic development and in population density as between Java and the other islands is in some measure a reflection of this policy. In the middle of the nineteenth century Dutch activity in the territories outside Java was largely confined to punitive expeditions. Not until after 1870 was there any large-scale economic development in these regions.

The interference of the Dutch government in the internal affairs of the Outer Provinces during this period was occasioned in large part by fear of British competition. By the treaty of 1824 the British had undertaken to make no further settlements in any island south of Singapore. Whether this applied to islands which lay mainly south of Singapore, although extending northwards of a line drawn east from Singapore, was a question which arose when James Brooke assumed rule over Sarawak in 1839 and again when the sultan of Brunei ceded Labuan to the British government in 1846. In both cases the Dutch government was forced to accept, under protest, the British interpretation. The British occupation of the northern coast of Borneo caused the authorities in Batavia to pursue a more energetic policy, particularly as British territorial expansion threatened to undermine Dutch influence in Sumatra. In 1857, an English adventurer, Wilson, attempted to set up a British vassal state in Siak, a district on the north-east coast of Sumatra, but as this contravened the clause in the treaty of 1824 by which the British agreed to abandon Sumatra, he failed to get support from Singapore and in the following year Dutch troops occupied the territory, with its dependencies of Deli, Serdang, Langkat and Asahan. Although in this case the British kept to the treaty regulation made in 1824, they took advantage of the ambiguity of the clause by which they undertook to forego all claims to territory in Sumatra. In agreeing to this, the British had not intended thereby to abandon commercial privileges with the native states, which they regarded as independent. Since the treaty of 1824, moreover, provided that no new arrangement by either power should be made to the prejudice of the other's trade, the British protested that when the Dutch took over Siak their action was an infringement of the treaty as being prejudicial to British interests.

About the same time as the Dutch were extending their political

influence over Siak and the north-east coastlands of Sumatra they successfully subdued Palembang, the Lampoeng districts in the south of the island and established friendly relations with Atjeh. In this period also, the island of Billiton was brought under direct rule and tin-mining began with the founding of the Billiton Tin Company in 1852.

The Dutch proceeded to deal with Atjeh shortly after 1837, when the Padri War was brought to a successful conclusion, for the Atjeher were a danger to the Dutch settlements in Natal and Tapanoeli on the west coast.* In their dealings with Atjeh the Dutch were hampered by the treaty between Atjeh and the British in 1819, and by the undertaking given in the settlement of 1824 that the independence of Atjeh would be respected. The Dutch feared complications if another foreign Power should gain a foothold in Sumatra, and tried to establish friendly relations with Atjeh by a treaty of 'peace, friendship and trade' in 1857. These friendly relations were immediately disturbed by the arrangement in the following year, which made the Dutch nominally the overlords of the petty states north of Siak that in fact were clients of Atjeh. The position became more serious with the opening of the Suez Canal in 1869, for the Dutch had accepted the responsibility for policing these waters, but were unable to fulfil their obligations without subjugating Atjeh. Finally in 1871 the British government recognized the difficulties of the Dutch and, by the Sumatran treaty of that year, gave them a free hand against Atjeh. This opened a new chapter in Dutch relations with the archipelago.

In the other islands of the Outer Provinces few important political changes took place in the middle years of the nineteenth century. In the period 1850-56 two Dutch expeditions restored order in west Borneo, where the Boeginese pirates along the coast and the Chinese mining colonies (*kongsit*†) in the interior had long remained powerful. In south Borneo a resident was appointed at Bandjermasin, but he was merely a political agent who had no concern with internal affairs until 1846, when Dutch interest was aroused by the discovery of coal in Martapoera. The working of the mines led to a conflict with the sultan. In 1860 the Dutch abolished the sultanate and annexed the territory. Eleven years before the settlement of

* Natal and Tapanoeli were made over by the British to the Dutch in the treaty of 1824.

† The word *kongsit* signifies 'the administration of common interests'. The *kongsit* in west Borneo were groups of Chinese who had banded together to work the gold mines of this region.

affairs in south Borneo, a punitive expedition occupied part of the island of Bali, for, despite the formal agreement by the rajahs in 1841 to respect Dutch suzerainty, there was constant and increasing friction. More significant events were taking place in the Moluccas at this period, for the middle years of the nineteenth century witnessed the first definite break in the rigid monopoly system as it applied to these islands. In 1854 several ports of the Moluccas were opened to ships of all nations; in 1863 the monopolies of cloves and nutmegs were abolished. The Dutch, however, were reluctant to allow foreign Powers any pretext for intervening in the east of the archipelago and, with a view to forestalling British or French designs on New Guinea, assumed possession of the western part of the island in 1828 and founded a settlement in Triton bay. This proved so unhealthy and so exposed to the attacks of pirates that it was abandoned in 1836; after that the Dutch were content to demonstrate their sovereignty by an occasional visit of a warship.



Fig. 8. Dutch acquisition of the Outer Provinces

The areas under Dutch rule in 1815 are shown in black. The dates indicate the year when each particular area came under Dutch control.

Source: (1) *Atlas van Tropisch Nederland*, plate 10 (Batavia, 1938); (2) Bernard M. Vlekke, *Nusantara, a History of the East Indian Archipelago* (Cambridge, Mass., 1943).

THE EAST INDIES UNDER THE LIBERAL SYSTEM, 1870-1900

Under the Liberal System, which formed the basis of Dutch colonial policy between 1870 and the close of the nineteenth century, government enterprises and compulsory labour were decried and free scope

was given to the growth of private economic interests. This period witnessed a remarkable development in agricultural production. The production of sugar rose from 152,595 tons in 1870 to 380,346 tons in 1885 and there was a growing export of tobacco, coffee and tea. It was in these years that the *cultuurgebied* of north-east Sumatra began to develop as an important agricultural region, though planters had been settling there since 1863. In Java, the cultivation of cinchona bark was first developed at this time and by 1900 the production of cinchona had reached 6,000 tons. The mineral resources of the East Indies were also being developed on an increasing scale. The output of tin from the mines on Bangka and Billiton expanded rapidly, while the oilfields in Java, Sumatra and Borneo began to be opened up. Much capital was expended on these agricultural and mining enterprises and between 1860 and 1880 a number of trading companies and banks were established to lend money to private promoters. Of these companies, the most important was the N.H.M., which had played the leading part in carrying and selling the government products during the period of the Culture System. Other companies, notably the Deli Tobacco Company, were promoted by the N.H.M. which also established branches in widely scattered parts of southern and eastern Asia.

The application of Liberal principles in the economy of the Netherlands Indies was not the only cause of this expansion of commerce and industry. The opening of the Suez Canal in 1869 was a significant factor, for it lowered the costs of transportation between the East and the West and, since the prices of commodities could thereby be reduced, this had the effect of expanding the market for tropical products. The rapid growth in importance of the steamship was also a contributing factor to the commercial boom.

The turn of the century saw a reaction against the Liberal regime for in many quarters it was felt that, though private enterprise should continue to be encouraged, the natives should be protected from economic exploitation. In 1901 the Netherlands government accepted the principle that it had a moral duty to fulfil towards the Indonesian peoples and henceforth determined to shape its policy in the interests of the natives and not of those in control. The measures taken by the government since then have been conceived and applied in accordance with this principle.*

* For an account of economic affairs in the Netherlands Indies in the period since 1900 see the chapters on agriculture, industry and commerce in this handbook.

THE SUBJUGATION OF ATJEH, 1873-1900

During the last quarter of the nineteenth century the relations with the state of Atjeh in northern Sumatra were a dominant issue in Dutch colonial policy; the great expenditure on the long-drawn war, with its many reverses and disappointments, was a main factor in transforming the economic relations between the Netherlands Indies and the mother country, and its triumphant conclusion was the signal for a rapid expansion over the rest of the archipelago. In 1868 Atjeh had voluntarily placed itself under the protection of Turkey, and Italy was discussing the suitability of Atjeh as a penal colony. As the prospect of war with the Dutch grew imminent its sultan sought for help from Turkey, Italy, France and the United States, and the consul of the United States in Singapore went so far as to draft a treaty promising American support. Hereupon the Dutch seized an occasion to declare war, and in 1873 an expedition landed near Koetaradja, the capital of Atjeh. This met with little success, but in the following year another expedition captured the stronghold of the sultan at Koetaradja, where the Dutch established a post. The sultan died, and the capture of Koetaradja was taken to imply the subjugation of the whole kingdom. But the people rose against the infidels, and even in Koetaradja the Dutch were insecure until they had set up a ring of outposts, within which they were besieged. In 1878 active operations were resumed and the whole Atjeh valley was conquered before the end of the following year. This again was taken to mean a final victory. But the coast dependencies now joined the Atjeher, and in 1884 the Dutch decided to concentrate in Koetaradja and abandon all attempts to rule the country, hoping gradually to extend their influence by the lapse of time and with the help of an Atjeh chieftain, who had joined their party. This man, Toekoe Oema, was supplied with ammunition and allowed to garrison the inland posts. In 1896 he deserted, with all his men, arms and ammunition, and placed himself at the head of the hostile forces. The Dutch position was now critical, and they were again obliged to concentrate in Koetaradja.

For some years past the Islamic scholar, Professor Snouck Hurgronje,* had been urging that the policy of conciliation was

* Snouck Hurgronje was Professor of Islamic Law and Religion at the Institute for Indonesian Studies at Leiden. In 1885 he lived for several months at Mecca and in 1890 went to the East Indies as an adviser on Muslim affairs. During his stay in the East he made a special study of Atjeh and in 1893 published his classic work *De Atjehers*.

destined to failure; success could be achieved only by crushing the enemy and introducing a strong but constructive administration. He was supported by Van Heutsz, the most outstanding figure in the Dutch army. By vigorous action Oema was driven back; new headquarters were established at Indrapoeri, with local bases at Lhas Nga and Djot Mandjang. These three posts were linked up by a light railway and served as centres for mobile columns, which could take action immediately wherever the enemy appeared. At the same time, the native population was disarmed, hill villages, where hostile bands could take refuge, were demolished, and roads and bridges were constructed to facilitate the movement of troops. By the beginning of 1898, Oema was driven out of Atjeh, and Van Heutsz, now appointed civil and military governor of Atjeh, took up the task of subjugating the dependent principalities. First he dealt methodically with the states along the east coast, where Oema had taken refuge. As each state surrendered he imposed a heavy fine, payable in pepper, which brought in a substantial contribution to the cost of the campaign. Within a year of his appointment he had driven Oema to the west coast, where in February 1899 he was ambushed and slain. Before the end of that year Van Heutsz had subdued all the states along the east coast, and during the following year he turned his attention to the west coast. By 1900 nearly all the district chiefs had surrendered and it could be claimed that the thirty years' war in Atjeh was ended, although the sultan himself held out until 1903, when he surrendered and acknowledged Dutch sovereignty.

The subjugation of Atjeh is memorable as marking a new policy towards the native states. Previously the Dutch had required dependent princes to sign long contracts setting forth in great detail the rights conceded to the Dutch. Snouck Hurgronje urged that this procedure was futile; all that the native princes wanted was a guarantee of their position so long as they were amenable to Dutch requirements. On his advice, therefore, the native rulers in Atjeh were required to sign a 'short declaration' (*korte verklaring*) containing only three articles: the ruler admitted that his territory was under Dutch rule; undertook not to enter into political relations with foreign powers; and thirdly, agreed to comply with all such rules and orders regarding his state as the government should prescribe. This 'short declaration' has since been adopted for most of the native states throughout the archipelago.

The surrender of the sultan in 1903 was in itself of no importance, for he had little influence. The strength of the resistance lay in its

religious, racial and national character, and sporadic outbreaks continued during the rest of 1903 and later. The Japanese victory over Russia gave fresh life to the native opposition, and the sultan and religious leaders entered into secret negotiations with Japan with the object of securing an alliance and munitions. The unrest was partly due to excessively harsh rule, and in 1907 Van Heutsz, now Governor-General, visited Atjeh to introduce a milder policy, which was adopted with some considerable success by a new governor. Even in 1912, however, it was still necessary to hunt out guerilla bands, and there were further raids in 1915. But in 1918 the country was deemed fit for the introduction of normal civil rule.

POLITICAL EVENTS IN THE OUTER PROVINCES, 1900-10

During the Atjeh War the Dutch were too fully occupied to attend to their possessions elsewhere and their agents were merely 'living signboards to keep off foreign trespassers'. But in the Convention of Berlin in 1884 the European Powers had accepted the principle that possession must depend on effective occupation. They were casting greedy eyes on the Far East and the Dutch were apprehensive of foreign intervention. Moreover, large combines were reaching out their tentacles over the tropics to safeguard their supplies of raw materials, and foreign capital was pouring into the Netherlands Indies to develop its resources in oil, rubber, tea and other products.

In the sultanate of Djambi on the east coast of Sumatra there was continual unrest until the subjugation of Atjeh encouraged the Dutch to take strong measures. Military operations from 1901-04 suppressed all opposition and in 1906 the sultanate was abolished and the country brought under direct rule. The entanglement in Atjeh also precluded forcible action in Riouw. In 1903 the Governor-General personally warned the sultan that he would be deposed if he remained contumacious, but the effect soon passed away and he resumed a hostile attitude. In 1911 therefore he was deposed, a pension was granted to him and to his heir, and his territory was annexed. Further north planters had been settling in Deli since 1863. Here, and in the adjacent states, the administration was in large measure in the hands of planters acting in the names of the local rulers. The situation was complicated because both Siak and Atjeh claimed rights over these states; but in 1884 the sultan of Siak sold his claims to the Dutch

government, and the subjugation of Atjeh left the native rulers wholly dependent on the Dutch government. In the western mountain region the whole Batak country had been brought under Dutch rule by 1906; on Nias, head-hunting was suppressed and the island gradually pacified.

Effective Dutch rule was also extended to the other islands of the archipelago in this period. An expedition in 1905 succeeded in establishing effective rule in Borneo. The boundaries between Dutch and British territories in this island were determined by the treaty of London of 20 June 1891; they were more closely defined in a protocol of 28 September 1915. In the same year as the Dutch expedition visited Borneo another was sent to southern and central Celebes and in 1906 the sultan of Ternate, in consideration of a pension, made over to the Dutch his rights in eastern Celebes. Further east, the danger of foreign intervention was especially acute, as in 1884 Britain had established a protectorate over south-east New Guinea and in 1885 Germany had annexed the north-east part of the island. The Dutch, therefore, bought off the claims of the sultan of Tidore over western New Guinea and introduced a regular administration there between 1898 and 1902. On 16 May 1905, a treaty fixed the boundaries between Dutch and British New Guinea. From 1905 onwards the Dutch took similar precautions in the Lesser Soenda islands, and in 1908 arrived at an agreement with Portugal by the demarcation of their common boundary in Timor. In Bali and Lombok matters ran less smoothly. Here the Dutch were so conciliatory that in 1884 they complied with an ultimatum requiring them to withdraw their ships within eight days, and not for ten years did they feel strong enough to assert their power. An expedition was then sent against Lombok, and its dependency, Karangasem, was taken over by the Dutch. Gianjar, another dependency, seeing that under Dutch protection Karangasem was secure against its neighbours, likewise accepted Dutch rule. This action caused resentment in the other parts of Bali and Lombok. Van Heutsz, therefore, took action to complete the subjugation of the islands. Although it was not until 1914 that the last soldier left Bali, Dutch rule had made such progress under Van Heutsz that, when he laid down his charge in 1909, 'it was as if one had come into a new world'. For the first time since the Dutch arrived in 1596 all the islands were brought effectively within a single realm, and foreign Powers could no longer intervene on the ground that the Dutch were neglecting their possessions.

GROWTH OF NATIONALISM, 1900-14

Chinese Nationalism

The nationalist movement in the Netherlands Indies began among the Chinese and may be dated from 1899, when the recognition by the Dutch government of the Japanese as legally in the same category as Europeans offended the Chinese, to whom this status was in general denied. Among the Dutch there was a strong feeling against the Chinese on the alleged ground that their influence was prejudicial to the natives. This sentiment found expression in measures adverse to the Chinese interests in money lending and trade in opium. Stimulated by these grievances, and urged on from China, the Chinese in 1901 began to establish schools for the advancement of Chinese education, and in 1907 trade committees to promote their trade. Then in 1911 the foundation of the Chinese Republic aroused keen enthusiasm, and orders restricting the display of the new republican flag led to boycotts and riots, which had to be suppressed by force.

But the general trend of policy was in the direction of conciliation. The Chinese, like the other Foreign Orientals, had always been left under their own headmen. Up to 1900 they were restricted to special quarters in certain towns, and required a pass to travel about the country. Between 1904 and 1910 the restrictions on movement were relaxed, and the opening of private Chinese schools was countered by the provision of Dutch-Chinese schools. From 1911 onwards there was further progress in removing the restrictions on travel, and in 1919 all restrictions as to residence in Java were abolished; in 1926 this measure was extended to the Outer Provinces. Thus, the whole policy of segregation was gradually abandoned. During the same period the legal position of the Chinese was improved. In the Constitution of 1854 they were placed on the same legal footing as the natives. Until 1899 they acquiesced in this position, but the new legal status accorded to the Japanese in that year encouraged the Chinese to agitate for a similar recognition. Although, together with the natives, they derived benefit from various concessions in respect of status and judicial procedure, it was not until 1925 that they obtained almost complete exemption from the civil jurisdiction of the court for natives, and the demand to be placed on the same legal footing as Europeans has not yet been granted, though in 1930 the government announced that this measure was under consideration.

This policy of conciliation has taken the edge off Chinese nationalism. For a short time about 1925, when Chinese communism

spread to Java, there was an uneasy alliance between Chinese and Javanese communists. In general, however, the rise of nationalism among the natives has brought Chinese and Europeans closer together, and the Chinese nationalist movement in the Netherlands Indies has been chiefly important in stimulating native nationalism.

Native Nationalism

The work of Raden Ajeng Kartini, the daughter of a regent, as a pioneer in the cause of education for native women, marks the dawn of modern nationalism among the native peoples. Although she died in 1904, at the age of twenty-five, her four years' work in devotion to this cause had a lasting influence. The Japanese victory over Russia in 1905 and the success of Chinese nationalists stimulated a retired Javanese physician, Dr. Oesada, to tour the country, preaching the advancement of Java by education. He began his campaign in 1906 and in 1908, with the help of Raden Soetomo, a medical student who was later to become one of the most prominent leaders of nationalism, was able to create the first nationalist society, *Boedi Oetomo*, the Glorious Endeavour. This organization has done and is doing useful work, but chiefly among the 'intelligentsia', and on the whole has exercised a moderating influence. The next step followed closely on the declaration of a republic in China in 1911, but it took shape as a protest against Chinese sharp practices in the batik trade. The Javanese traders formed a society with their religion as a symbol of social unity, under a title subsequently abbreviated to *Sarikat Islam*. This spread rapidly among all classes, forming local societies with a central association, which in 1915 obtained the privilege of legal incorporation. Within five years after its foundation *Sarikat Islam* counted 800,000 members. In 1912, the year after the founding of *Sarikat Islam*, a purely religious Muslim movement started, known as *Muhammedya*; it developed much more slowly than *Sarikat Islam*. Meanwhile the nationalist movement was obtaining recruits from the domiciled community of European descent, mixed ordinarily with local blood. Many of these Indos, as they are termed, made common cause with the natives and founded an Indian Party, comprising both Indos and natives and aiming avowedly at independence. In 1913, however, the leaders of the party were suppressed and the party broke up.

ADMINISTRATIVE CHANGES, 1900-39

From 1870 until the end of the nineteenth century, liberalism had

been the guiding principle of Dutch colonial rule, finding expression chiefly in the freedom of private enterprise. The administrative machinery was still centred round The Hague and in the East Indies all power was vested in the bureaucracy headed by the Governor-General. As private enterprise in the East Indies grew in wealth and influence, it became impatient of control from home and of bureaucratic rule, and there was a general demand for decentralization. Moreover, the spread of private enterprise from Java to the Outer Provinces was making it desirable to bring these under effective administration. In addition, the growing reaction against a *laissez-faire* policy was encouraging the view that the State ought to take active measures for the promotion of general welfare. Thus, from about 1900 onwards there was a general trend in the direction of a decentralized, efficient and sympathetic administration, which the Dutch distinguish as the Ethical System.

During the early period of the growth of a nationalist movement in the Netherlands Indies the government devoted much of its energy to the gradual development of local autonomy. The Decentralization Law of 1903 provided for the 'delegation of powers from the central authority to lower organs of government'. In the following decade residency and urban councils were formed in Java, a council was formed for the *cultuurgebied* of Sumatra, and councils were also established in many other rural areas of the Outer Provinces. A step towards self-government for the Javanese village (*desa*) was taken in the Village Ordinance of 1906 which attempted to turn each village into an image of the Dutch *gemeente*, with council meetings, popular votes, budgets and accounts. At the same time officers of the civil service, European and native, with the help of departmental experts, urged on the headman and his council numerous reforms in education, sanitation, agriculture, and veterinary matters. Of greater importance in the history of self-government in the Indies was the creation in 1916 of the Volksraad or People's Council. The establishment of some kind of representative assembly in Batavia had been debated for many years and the advantage of such an assembly became more evident with the rise of nationalism and with the outbreak of war in 1914. The Volksraad was constituted by an enactment made in 1916 and its inaugural session was opened by the Governor-General on 18 May 1918.

The powers of the Volksraad were limited at the time of its institution, for, under the constitution then in force, the Netherlands Indies government could not act independently of the government

in The Hague. Administrative reforms undertaken in 1922 culminated in the drafting of a new constitution (*Indische Staatsregeling*) for the Netherlands Indies in 1925. Supreme executive and legislative powers were given to the Governor-General who, except in a few cases, did not require the approval of the government of The Hague in his decisions. The authority of the Volksraad was greatly increased, for the constitution laid down that the Governor-General must seek its advice and in some of his decisions have its approval (see p. 112).

The administrative reforms of 1922 and 1925 helped also towards the development of a decentralized form of administration. The Netherlands Indies was to be distributed among large Governments, and then each Government, as circumstances might allow, was to be converted into a Province, by equipping it with a local council for dealing with special local interests. Under this scheme three Governments have been formed and converted into Provinces: West-Java, 1926; Oost-Java, 1929 and Midden-Java, 1930. The two Residents in the native states of Java were promoted to the rank of Governor, largely by way of compliment to the native rulers. In the Outer Provinces three Governments were constituted with effect from 1938; the Governors have been given the assistance of advisory bodies, but, as legislative councils have not been formed, the Governments have not as yet been converted into Provinces.*

GROWTH OF POLITICAL PARTIES AND OF NATIONALIST MOVEMENTS, 1914-39

The rise of nationalism among the native groups stimulated the growth of political parties among the Europeans in the Netherlands Indies. In 1914 the Social Democratic Union of the Indies (I.S.D.V.) was formed to represent the Social Democratic Party of the Netherlands. This was countered by the *Nederlandsch-Indië Vrijzinnige Bond* (N.I.V.B.), a Liberal organization which aimed at uniting moderate progressives of all races. In opposition to these secular parties there formed the Christian Ethical Party and the Roman Catholic Party of the Indies. About the same time the I.S.D.V. developed revolutionary tendencies, and the more moderate elements split off to form the Social Democratic Party of the Indies (I.S.D.P.) leaving the original I.S.D.V. an extremist party with communist views.

* For further details of the administrative system in the Netherlands Indies see Chapter IV, *passim*.

At the opening of the Volksraad in 1918 most Europeans looked to the development of Java as a province of Europe in the East. When the nationalists demanded separation many took alarm, and formed the Political Economy Bond (P.E.B.) advocating cautious progress under the Dutch flag. Others, more sympathetic with nationalist ideas, formed the *Stuw* group. Then, as the nationalist demands grew more extreme, there was a reaction among Europeans, which found expression in 1929 in the formation of the Vaterlandsche Club (V.C.). For some this club was too moderate, and they formed a Fascist organization, but this, despite a visit from the Dutch Nazi leader, Mussert, in 1935, expired in 1937. Thus, the political situation in the Netherlands Indies is complicated by party rivalry among Europeans.

Under European influence the programme of *Sarikat Islam*, which, as already mentioned, was the chief nationalist party in 1914, took on a colour of anti-capitalism, and at the end of 1918 the radical block in the Volksraad included the representatives of *Sarikat Islam*, *Boedi Oetomo* and *Insulinde*, the offspring of the defunct Indian Party. The economic unrest consequent on the war of 1914-18 popularized nationalist ideas, but the native labourer was too poor and ignorant for any lively interest in socialism and the great bulk of the party cared only for nationalism with Islam as its symbol. The leader of the revolutionary section formed a Communist Party (P.K.I.) in 1919, which, two years later, broke off from the main body of *Sarikat Islam*.

New developments took place in 1922. Since 1908 there had been a small Indian Club in the Netherlands, comprising both Indos and natives. In 1922 the mixed club was transformed into a racial Indonesian Society under the leadership of Dr. Soekomo, and the members who came out to the East threw in their lot with the extremists. Largely under their influence the nationalist movement took over from India the policy of non-cooperation, and became more revolutionary. Another development was an extension of the movement in the Outer Provinces, and the representation of nationalists from all over the archipelago in the First All-India Congress. The post-war depression multiplied industrial disputes and a railway strike in 1923 was met with an amendment of the Penal Code by a provision imposing heavy penalties on action likely to dislocate economic life. For some time the leaders of the nationalist movement had been in touch with Russia, and this led to an understanding between the Indonesian and Chinese communists, which took effect

in a series of strikes, notably a great strike in the metal industry in 1925, forcibly suppressed under the new legislation. At length this phase of the movement culminated in a serious insurrection in Java at the end of 1926, followed by a second outbreak in Sumatra early in the following year. The criminal law was strengthened, Dr. Soekomo and other leaders were interned, and measures taken to improve the secret service and to restore closer contact between the officials and the people. Thus, for the time being, the revolutionary party was defeated.

The failure of the revolutionary movement allowed the older organization, *Sarikat Islam*, to resume its position as the main organ of nationalism, but, under the guidance of students from Europe, it paid more attention to promoting education and studying economic conditions by the foundation of schools* and study clubs. The first of these Study Clubs was founded in 1924 by Dr. Soetomo who when a student had helped in the foundation of *Boedi Oetomo* (see p. 96). In 1927 the Study Club in Batavia organized the P.N.I. (*Persekutuan*, later *Partai-Nasional Indonesia*) with the object of linking up all nationalist associations. At the same time *Sarikat Islam*, which had adopted a new style *Partai Sarikat Islam Indonesia* (P.S.I.I.), was hardening in the direction of non-cooperation. In the competition for extremism, agitation was making renewed headway in the P.N.I., until this party was broken up by the prosecution of its leaders in the beginning of 1930. The collapse of P.N.I. was soon followed by a rupture between *Sarikat Islam*, representing the religious aspect of nationalism, and the secular leaders, representing the material economic aspect. The secular party further broke up into three groups, differing not in aim but in method, and contending among themselves for the leadership of the movement. These three groups were the *Partai Indonesia* (P. I.), claiming to inherit the mantle of the P.N.I. and, like the P.S.I.I., standing for non-cooperation; the *Partai Bangsa Indonesia* (P.B.I.), representing the Study Clubs and a policy of conditional cooperation; and the *Partai Rajat Indonesia* (P.R.I.), advocating cooperation with the government but attracting little support among the people.

By this time the Netherlands Indies was succumbing to the general economic depression and, as this grew deeper, party politics lost much of their interest. *Sarikat Islam* managed to survive as P.S.I.I.

* The educational movement, founded by Dewantoro, a Javanese of noble birth, was known as *Taman Siswa* (Children's Garden). *Muhammedya* was also accomplishing much important social work.

but the secular groups broke up, amalgamated, dissolved and were re-constituted in a succession of kaleidoscopic changes. When the depression lightened, a more moderate or realist temper could be discerned. There was a general disposition to recognize the sovereignty of the Netherlands, but with the Netherlands Indies on a footing of equality with the mother country and with a right of self-determination (*zelfbeschikkingsrecht*) within the Netherlands commonwealth (*rijksverband*). Some considerable stir was caused by a petition to this effect by a nationalist leader, Soetardjo, which was approved by the Volksraad in September 1936. The moderate trend was visible in both *Sarikat Islam* and the secular parties. Although the main body of P.S.I.I. still held by the policy of non-cooperation, it did so only by evicting a strong group of cooperators, who in 1937 formed a new association, the *Comité Penjadar Barisan*. The chief secular parties were now the *Partai Indonesia Raya* (*Parindra*) which was non-committal as to cooperation; and the *Gerakan Rakyat Indonesia*, which accepted cooperation. The *Muhammedyah*, which voiced the specific interests of Islam and which had slowly been gathering force, has become in recent years the chief religious group.

RELATIONS WITH JAPAN, 1918-39

Relations with Japan came to demand serious attention with the growth of imperialist views in Japan and the development of Japanese trade in the Netherlands Indies during and after the war of 1914-18. When Great Britain, the United States, France and Japan concluded a treaty in 1921 for the maintenance of their rights in relation to their respective insular possessions in the region of the Pacific Ocean, the Dutch government invited their attention to Dutch claims, and in 1922 all four powers agreed to respect Dutch possessions in that region. The Dutch government was still apprehensive of Japanese encroachment, and in 1925 a special Adviser for Japanese Affairs was appointed. Then, with the economic depression and the devaluation of the yen in December 1931, the problem assumed new dimensions. In 1934 the Java Bank reported that it was 'practically impossible to name any category of goods in which European and American industry could compete with that of Japan'. Meanwhile the Japanese had been mastering the secrets of Dutch success in the cultivation of sugar, buying up quinine from the natives to the prejudice of the Dutch monopoly, and busily exploring the coasts throughout the archipelago under the colour of developing sea-

fisheries; a Japanese company had also taken over from Germany an extensive concession in New Guinea. At the same time they were getting into closer touch with the interior by opening, in all the larger towns, departmental stores in which they employed native assistants to sell cheap and attractive goods. These activities were financed by Japanese banks, of which the first had been opened in 1915; and the overseas trade with Japan was practically a monopoly of Japanese lines. This formidable and organized economic penetration naturally caused the Dutch to be apprehensive as to its political consequences, and further grounds for uneasiness were furnished by the growth in Japan of numerous South Seas Associations for the promotion of Japanese interests in southern Asia and the Pacific. One aspect of the situation to which the Netherlands Indies government took exception was that, while the imports from Japan were rapidly increasing, exports to Japan remained at the former low level or declined. The precautions to safeguard local interests by a system of quotas and licences (see p. 307) aroused resentment in Japan, and the problem shifted from the domain of economics to that of politics. Japan obtained permission in 1934 to send a delegation to Batavia, but the negotiations were inconclusive.

At that time Japan stood alone, whereas the Dutch could reckon on the support of Great Britain and the United States; they were able therefore to make a firm stand against concessions. In 1936 the tension was eased by an agreement as to their respective shares in the traffic between Japan and the Netherlands Indies, and from 1937 onwards the Japanese were fully occupied in China. Rumours of a secret clause relating to the Netherlands Indies in the Anti-Comintern Pact of 1936 between Germany and Japan, and continued agitation by Japanese politicians and journalists for a more active policy in the Netherlands Indies and especially in New Guinea, kept the Dutch on the alert, and stimulated them to take measures for the economic development of that island, previously neglected. It was not until after the outbreak of war between Germany and the Allies in 1939 that Japan took any further official steps towards the readjustment of relations, which in 1941 led to their invasion and occupation of the Netherlands Indies.

BIBLIOGRAPHICAL NOTE

1. For general works on the history of the Netherlands Indies, see p. 69.
2. The policy and economic principles of Daendels are discussed in S. J. Ottow, *Der Oorsprong der conservatieve richting* (Utrecht, 1937).

3. Apart from the *Memoir of the Life and Public Services of Sir Thomas Stafford Raffles* (London, 1830), published by Lady Raffles after the death of her husband, a number of biographies of Raffles have been written, of which the most recent is R. Coupland, *Raffles, 1781-1826* (Oxford, 2nd edition, 1934).
4. The best account in English of the Culture System is J. S. Furnivall, *Netherlands India*, pp. 115-46 (Cambridge, 1939). The history of the N.H.M. is dealt with in W. F. M. Mansvelt, *Geschiedenis van de Nederlandsche Handelsmaatschappij* (Haarlem, 1924); there is an abbreviated edition of this work in English entitled *A Brief History of the Netherlands Trading Society, 1824-1924* (The Hague, 1924).
5. Dutch colonial policy and administration in the late nineteenth and early twentieth centuries is described in A. D. A. de De Kat Angelino, *Colonial Policy*, 2 vols. (The Hague, 1930).
6. A short survey of the rise of nationalism appears in H. Colijn and D. G. Stibbe, *Nederland-Indië* (Amsterdam, 1929), and in Sir Hesketh Bell, *Foreign Colonial Administration in the Far East* (London, 1926). See also J. Th. P. Blumberger, *De nationalistische beweging in Nederlandsche-Indië* (The Hague, 1931) and the article by Virginia Thompson in *Government and Nationalism in South-east Asia*, ed. by Ralph P. Emerson (New York, 1942).
7. On the relations of the Netherlands Indies with Japan see J. J. Gelderen, *The Recent Development of Economic Foreign Policy in the Netherlands East Indies* (London, 1939) and E. D. van Walree, *Economic Relations of the Netherlands Indies with other Far Eastern countries* (Amsterdam, 1935).

Chapter IV

GOVERNMENT, ADMINISTRATION AND LAW

Introduction: Constitution: Influence of the Netherlands Government in East
Indian Affairs: Central Government: Local Government: Legal System:
Police System: Bibliographical Note

INTRODUCTION

The present system of administration is the result of a process of gradual evolution. Under the Dutch East India Company final authority rested with the directors; on the fall of the Company it passed to the home government, represented from 1815 by the Crown, and from 1854 by a minister responsible to the States-General. General administration now rests with the civil service, comprising two branches, the European and the native; the European branch derived originally from the mercantile agents of the Company, who came to be known as residents, and the native branch from the local sultans (in Java, regents) through whom the European officials dealt in their relations with the people. Up to about 1900 the tradition survived that the resident (or his European subordinates) should deal with the people only through their recognized or appointed heads and especially should abstain from interference within the village, 'the holy hamlet'. This tradition had ceased to correspond with fact, since from the 'seventies onwards, but especially after 1900, the spread of private enterprise over the whole archipelago placed new responsibilities on the officials and called for a more active and efficient local administration. At the same time the government was developing a keener sense of responsibility for the welfare of its subjects, and this likewise called for a more intensive and varied administrative policy. Efficiency in both economic progress and native welfare required decentralization: the delegation of powers from the home government to the colonial government, from the colonial government to local authorities, and from European to native officials. At the same time, local Europeans and later, under nationalist influences, natives, were demanding a share in government. It was mainly under these influences that the administrative organization has taken on its present shape.

CONSTITUTION

The constitution of the Netherlands Indies is based on the Fundamental Law (*Grondwet*) of the Netherlands of 1922, last revised in 1938. This defines the political status of the Netherlands Indies by stating that 'the Kingdom of the Netherlands comprises the territories of the Netherlands, Netherlands India, Surinam and Curaçao'. It also defines the position of the Netherlands Indies within the kingdom in respect both of government and legislation. The supreme government (*opperbestuur*) is vested in the Crown, that is, in the colonial minister, acting in the name of the Crown but responsible to the States-General; the ordinary government (*algemeen bestuur*), apart from powers legally reserved to the Crown, is vested in the Governor-General in such manner as may be prescribed by law, that is, by enactment of the States-General. With a view to enabling the States-General to exercise control, a clause provides that the Crown shall furnish it with an annual report (*Indisch Verslag*) on the government and condition of the Netherlands Indies. A similar distinction is drawn between supreme legislative power and ordinary legislative power, though the term supreme legislative power is not actually used. Supreme legislative power is vested in the Dutch legislature, which is empowered to enact the constitution of the Netherlands Indies, and also other matters if necessary; in such cases the representative body of the Netherlands Indies must first be heard. But the regulation of internal affairs is left to the local legislative organ, except for such matters and cases as are reserved by law to the Crown. With a view to enabling the home government to exercise control over local legislation, the act provides that any such regulation may be suspended by the Crown or annulled by law on the ground that it conflicts with the *Grondwet*, or with the general welfare.

As required by the *Grondwet*, the Netherlands legislature in 1925 enacted the constitutional law of the Netherlands Indies (*Staats inrichting van Nederlandsch-Indië* or, briefly, *Indische Staatsregeling*), subsequently amended in 1929, 1935, 1936 and 1938. This law laid down the powers of the Governor-General, of the Council of the Indies (*Raad van Nederlandsch-Indië*) and of the *Volksraad*; among other matters it defined the nature of the financial administration.

Forms of Legislation. The *Grondwet* recognizes legislation for the Netherlands Indies by the Dutch legislature and by the Crown, and also local legislation. In local legislation the *Indische Staatsregeling*

recognizes legislation by the Governor-General, together with the Volksraad or alone. All four classes of enactments are included under the term 'general regulations' (*algemeene verordeningen*). The Crown and the States-General acting together have powers, restricted only by custom, to frame laws (*wetten*) for the whole kingdom of the Netherlands, including the Netherlands Indies, and also for the Netherlands Indies alone. The Crown, so far as authorized by law, can issue decrees having the force of law (*algemeene maatregelen van bestuur*); this term covers original legislative acts, rules for the working of the laws and executive commands. The Governor-General and the Volksraad, acting together, can enact ordinances (*ordonnanties*) with reference to the internal affairs of the Indies and having the force of law. The Governor-General, so far as authorized by law, can issue government regulations (*regeringsverordeningen*) having the force of law; this term covers original enactments by the Governor-General and also rules for the working of ordinances.

INFLUENCE OF THE NETHERLANDS GOVERNMENT IN EAST INDIAN AFFAIRS

The government of the Netherlands is supreme in respect both of policy and legislation. The Crown and States-General formally act together only in legislation; but some enactments, such as the sanctioning of the estimates, belong in substance to the sphere of policy. The States-General exercises a further control over policy through its hold on the colonial minister, and through the annual report on the East Indies (*Indisch Verslag*). Although the only subject reserved by law for legislation by the Crown and States-General is the constitution of the Netherlands Indies, the home government also has the right to legislate on other subjects if necessary. Some measures of the Dutch legislature are binding for the whole kingdom, including the Netherlands Indies, such as the conferment of titles, coinage, copyright, and trade-marks. Certain enactments of the Dutch legislature prior to the *Grondwet* of 1922 are still in force; notably the Accounts Law of 1864, the Coinage Act of 1912, and the Mines Law of 1899. Other subjects reserved to the home legislature are tariffs, ports and banking. The intervention of the home legislature in East Indian affairs is chiefly apparent, however, in the annual debate on the estimates; this is a tradition which has not yet died out.

The powers of the Crown lie mainly in the sphere of policy and administration. Certain powers, such as control over foreign relations

and the navy, are reserved under the *Grondwet*. Others are expressly conferred on the Crown in the *Staatsinrichting*. Of these the most important are the appointment and removal of the Governor-General, the direction of his policy, and control over his actions by the acceptance of responsibility for them. Other powers of the Crown are the appointment and dismissal of the Lieutenant Governor-General—this office has been vacant for over a hundred years*—and of certain other high officials, including the President of the High Court of Justice, and members of the Council of the Indies. Under the Accounts Law of 1864 the Crown has like powers in respect of members of the Chamber of Accounts. The Crown is also charged with deciding points of difference between the Governor-General and the Volksraad in cases where agreement is required by law.

Legislation by the Crown consists mainly in the enactment of rules giving effect to laws passed by the Dutch legislature, but the Crown is also expressly empowered to frame regulations as to shipping, passports, and certain other matters. Further the Crown acts in a legislative capacity in special cases where the Volksraad does not assent to a draft ordinance laid before it by the Governor-General.

Acts of the Crown, executive or legislative, are in practice the work of the colonial minister responsible to parliament. Under the Dutch system of government there is no Premier, and no rule of cabinet solidarity; the colonial minister may therefore be changed without any reaction on the government as a whole. Another feature of Dutch government is the preference for ministers with expert knowledge, who need not even be members of the States-General; thus the colonial minister usually has colonial experience in administration, in the law, or in commerce.

CENTRAL GOVERNMENT

The powers of the government are vested in the Governor-General, who is responsible to the Crown and is required to observe instructions given by the Crown. In fixing the revenue and expenditure, and in legislation, he normally acts together with a representative body, the Volksraad. He is also assisted by an advisory body, the Council of the Indies (*Raad van Nederlandsch-Indië*).

The overseas commercial interests of the government are mostly

* It was revived on the Japanese occupation of the Netherlands Indies.

entrusted to the consular branch of the Dutch Foreign Office, but it has its own representatives attached to consulates in countries where it has special interests: in Durban for South Africa, in New York and San Francisco for the United States, in Buenos Aires for Argentina and in Alexandria and Cairo for Egypt. It makes a financial contribution towards the Dutch consulate in Jeddah and has a commercial agent in Singapore and in Calcutta. All the more important powers, and those with local interests, are represented in the Netherlands Indies by at least one agent, and some maintain a consul-general, with consuls at each of the large ports.

Governor-General

The Governor-General is appointed by the Crown. The only qualifications required by law are that he shall be a Netherlander and not less than thirty years old; but he is legally debarred from having any private financial interest in the Indies during his term of office and for five years afterwards. Custom has prescribed that after five years he shall ask permission to resign. Ordinarily he resides at Buitenzorg (Plate 26), but he also has a residence in Batavia (Weltevreden). The emoluments are normally *f* 15,000 a month, but are liable to vary with the economic conditions. The last six Governor-Generals up to 1940 included three politicians, of whom two had previous experience of East Indian affairs, and three were members of the diplomatic service, of whom one had formerly been a member of the Council of the Indies.

The functions of the Governor-General are best indicated by the term *landvoogd* 'guardian of the land', generally accorded to him in constitutional literature and in popular usage. He is responsible for advancing the welfare of the country, and takes such measures as he deems necessary to that end. In this capacity he is the supreme executive authority in the East Indies and publishes, and gives effect to general regulations, including laws, crown decrees, and ordinances; for these and other purposes he can of his own sole authority make rules having the force of law. If circumstances require he can take action which ordinarily proceeds from the home government, or for which joint action with the Volksraad is prescribed. Before taking such extraordinary action he is expected, or required, to consult the Council of the Indies. He is the commander-in-chief of the army, and of such naval forces as are in East Indian waters. He appoints all the more important civil, judicial and military officials, except so far as this is reserved to the Crown. His administrative powers extend



Plate 26. Palace of the Governor-General, Buitenzorg

The photograph shows the south front of the palace overlooking the lotus pond of the famous Botanical Gardens.

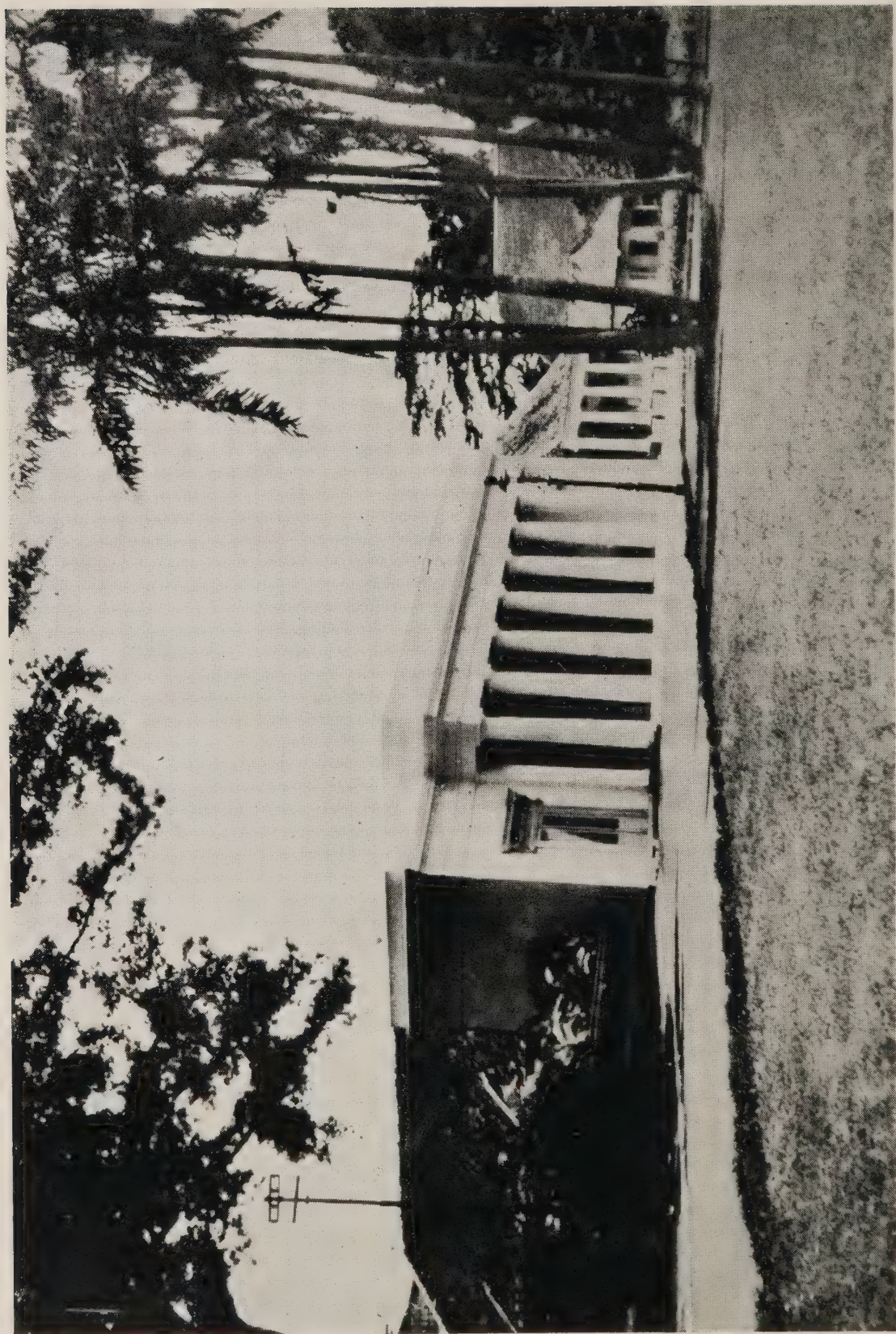


Plate 27. Volksraad building, Batavia

over the judiciary. He can decide conflicts of jurisdiction between the judiciary and the administration and between secular and religious, or civil and military courts. He has the right to pardon offenders and to grant exemption from prosecutions; in such cases he must consult the High Court of the Council of the Indies. If necessary, he can, with the consent of the Council of the Indies, intern or deport persons regarded as dangerous to peace and order; should the Council refuse assent he may refer the matter to the home government and, if urgent, may take action in anticipation of sanction. Thus, subject to approval by the Crown, not merely in the direction of policy but in everything, the final responsibility for all aspects of the administration rests with the Governor-General.

Council of the Indies

The Council of the Indies (*Raad van Nederlandsch-Indië*) consists of a vice-president and not less than four or more than six members. Until 1930 there were only four; the number was then raised to six to allow the inclusion of two natives, but in 1934 for the sake of economy was again reduced to four, including one native. All are appointed by the Crown, after considering recommendations made by the Governor-General in consultation with the Council of the Indies; but the Governor-General need not accept the advice of the Council, nor the Crown the recommendation of the Governor-General. The members are ordinarily chosen for their official experience, not necessarily in the civil service; as a rule, there is at least one member of the civil service, a member with judicial experience, and the former head of the secretariat. The period of office is five years.

The Council dates from 1609, and its powers and procedure are governed more by precedent and tradition than by law. It has no resemblance to a ministerial cabinet, with members separately responsible for different branches of the administration, but it examines as a whole all important matters from the standpoint of the general welfare. As a matter of practice the Governor-General consults it on all affairs of general or special importance, and in some matters is bound to consult it. Among these are instructions and regulations relating to the administration, drafted under his own orders; political relations with native princes and peoples; the general trend of measures regarding war or insurrections; extraordinary measures of importance; the appointment of high officials; proposals and communications to the Volksraad; proposals submitted by the

Volksraad; the adoption on his own authority of draft ordinances which the Volksraad has not accepted; and drafts of government regulations. Whenever the Council has been heard, whether by obligation or otherwise, this fact must be mentioned in the decree giving effect to the decision. The Governor-General, however, is wholly free to reject the advice of the Council, except in the following cases specified by law: cases of internment, banishment, or deportation; the grant of general pardons or withdrawal of prosecutions in respect to native princes and chieftains; dispensations from government regulations; and the application of the provisions relating to Europeans to persons who are not subject thereto. If the Governor-General cannot agree with the Council, he may appeal to the Crown, and in matters of urgency, can act in anticipation of sanction.

If necessary, the vice-president of the Council may be appointed to act on behalf of the Governor-General, or to officiate as Governor-General.

Volksraad

Until 1918 the government contained no element of popular representation, which so far had been extended only to local bodies. But in May 1918, a measure, passed two years previously by the States-General, took effect with the opening of the first Volksraad. The chairman is appointed by the Crown. At first there were thirty-eight ordinary members, half elected and half nominated, and including fifteen natives; its legal powers were purely advisory. The ordinary membership was enlarged to forty-eight in 1921, and to sixty in 1939. From the beginning, representation has been communal, with Europeans, Natives and Foreign Orientals separately represented; but the proportions and the methods of election have undergone changes. At present thirty members must be non-Dutch native subjects; at least twenty-five must be European-Dutch subjects, including Indos, and at least three must be non-Dutch foreign subjects, mostly Chinese. Of these some are elected: twenty natives, fifteen Dutch and three non-Dutch foreign subjects. The rest are nominated by the Governor-General. In the native states of Java the electorate consists of the four native princes and the senior of the two governors. Elsewhere, the electorate consists of the members of the local councils (see p. 119). The Dutch and the non-Dutch foreign subjects each form a single constituency for the whole of the Netherland Indies. In constituencies which return more

than one member, the system of proportional representation is adopted. Candidates are nominated and the voting is secret.

Membership of the Volksraad is confined to Dutch subjects, not less than twenty-five years old, who are also East Indian by parentage, birth or residence and not specially debarred as ex-convicts or dismissed officials. Domicile is forfeited by an absence of eighteen months, failing any presumption to the contrary. Membership is terminated by resignation or by absence from the East Indies for longer than eight months, the usual period of furlough. The Volksraad meets for a four year term, but all members are eligible for re-election. Government officials may be elected or nominated as members. In either case they can speak and vote freely, with full liberty to criticise government proposals, and there is no official block. Most of the members reside in Batavia, or not far off. Of the sixty-one members of the council as newly constituted in 1939 there were twenty-seven from Batavia, eight from Bandoeng, two from Buitenzorg, and only twenty-four from the rest of the Netherlands Indies. Owing to the transient character of the population few members sit in two or more successive councils. The members receive allowances to meet the expense of attending sessions (Plate 27).

There are two ordinary sessions of the Volksraad in each year. The first, which lasts from 15 June to 15 September, at the latest, is formally opened by the Governor-General and is mainly concerned with the consideration of the estimates; the second lasts from 10 January to 15 February. Extraordinary sessions can be called by the Governor-General, or at the instance of not less than one-third of the members; but the business is limited to the agenda. The sittings are normally public, but may be in secret. The quorum consists of half the members, and decisions are taken by a majority of votes. The Governor-General may attend the meetings, but has never done so; the government, however, may be represented by officers (*regeringsgemachtigden*) who can furnish information on its behalf; ordinarily this function is discharged by the departmental directors in respect of matters concerning their several departments. The Volksraad has power to reserve for itself in full session all matters with which it is concerned, and it tends to exercise this power on questions of principle or touching important native interests; for the most part, ordinary legislation is deputed to the College of Delegates (see p. 113).

The essential function of the Volksraad is to represent the interests of the Netherlands Indies and its inhabitants to the Crown, the

States-General and the Governor-General. For this purpose it is empowered to seek information from the Governor-General. The usual manner of representing its views to the Crown or the States-General is by an address; its views are communicated to the Governor-General in the form of a resolution. Legislative acts in which the Volksraad participates are termed ordinances. Ordinarily they originate in a draft by the Governor-General; but the assembly has itself the right to initiate legislation, and can amend drafts sent by the Governor-General. If the Volksraad and the Governor-General are in agreement, the ordinance is published by the Governor-General. The Governor-General may fix a period within which its decisions are to be announced. If his draft ordinance is not accepted within the stipulated period, or is amended in a form which he cannot approve, or is rejected, he may return it within six months for reconsideration. If agreement is not yet obtained the Governor-General may submit the draft to the Crown for enactment by decree. If the Volksraad does not announce its decision within such period as the Governor-General may prescribe, or if the matter is urgent, he may publish the ordinance on his own authority.

Financial measures take effect by legislation, but the procedure is somewhat different. For each administrative department a separate estimate is laid before the assembly on the opening of its first annual session; supplementary estimates, if necessary, are presented subsequently. Estimates adopted by the Volksraad are published by the Governor-General, but do not become law until approved by the States-General. Similar arrangements obtain with regard to other financial measures, such as the negotiation of public loans.

In general, the Volksraad is critical, and often sharply critical, of official policy and measures, and it is noteworthy that the official members are among the keenest, and naturally the best informed, critics of the government. The extreme freedom with which the members express their personal opinions supports the accepted view that criticism need not be prejudicial to the career of the official who voices it. Not only is there no official block, but the European members represent a wide variety of political views and by no means all belong to the right wing. Inevitably a system which allows the Volksraad no direct responsibility encourages irresponsible criticism, but criticism in the chamber is tempered by friendly intercourse in the lobbies, and the answers to criticism teach members that the task of the government is not so easy as it may seem. Thus both the government and the people are brought into closer contact with

reality. Moreover, indirectly the chamber exercises considerable influence over the government, as is indicated by the large measure of agreement obtained between the government and its critics. Among the thousands of items in the departmental estimates passed during 1928-38, in only eighty-four cases did the government and the Volksraad disagree; in one case a whole departmental estimate was rejected, thirty-one proposals of the government were negatived and fifty-two amendments by the Volksraad were not accepted by the government. Out of some 1,450 ordinances during the same period there were only about two dozen in which recourse was had to exceptional measures for overruling the assembly. On the whole there seems ample justification for the general opinion that the creation of the Volksraad has given new strength to the government, by making known the needs and wishes of the people. But the present division of powers is admittedly provisional and educational.

College of Delegates

A characteristic feature of all representative organs in the Netherlands Indies, copied from Dutch practice, is the delegation of most of the business to a small permanent committee. This enables the other ordinary members to take part in public life without undue demands upon their time. In the Volksraad this committee is known as the College of Delegates (*College van Gedelegeerden*), which consists of fifteen members who are elected in the first session of the newly formed chamber for its whole life of four years. In addition to the allowances drawn as members of the chamber the delegates draw a monthly salary, and allowances for residence and loss of income. The chairman of the Volksraad is also chairman of the College, but one of the members is elected as deputy chairman. The College sits throughout the year, except for a month's vacation about May. It exercises the full powers of the Volksraad, except during the regular sessions, but machinery exists whereby, during or between the sessions, subjects can be reserved for consideration by the full chamber.

The Secretariat

Although the constitution refers to secretaries, it does not mention the Secretariat as an organic body. But, through its function as a clearing house for departmental activities, and because of the intimate contact between the Chief Secretary and the Governor-General, the Secretariat came to be the hub on which the administrative machinery revolved. Since the introduction of a popular element

into the government, it has lost much of its importance, but there are still complaints that it exercises an undue influence that is unwholesome owing to a lack of contact with native life.

The superior grades in the Secretariat are recruited and trained in the same manner as officers of the European civil service in the Netherlands Indies, but the two services are quite distinct.

Departmental Organization

The constitution of several departments to deal with the various functions of general civil administration dates back to the Constitution of 1854. Since 1933 there have been six civil departments, dealing respectively with Justice, Finance, Internal Administration, Education and Religion, Economic Affairs, Communications and Public Works. Each of these departments is under a director, appointed by the Governor-General. There are two other departments, for War and Marine, of which the heads are nominated by the Crown. The directors enjoy a great measure of independence, and appoint most of the departmental employees. They are concerned not merely with the execution of tasks allotted to them, but contribute largely to the origination of projects, which they submit for consideration by the government. When a department is interested in the passage of a measure through the Volksraad, the director may attend to furnish any necessary explanations. The constitution provides for a council of departmental heads, but this has little significance, as it does little more than deal with matters common to two or more departments, mainly of a personal character. On such matters any member may record his views for circulation, but the council never meets. Each department comprises several distinct services or branches under special or local heads (inspectors). Subordinate officials of the various departments are widely distributed over the archipelago. The departmental officers work in close relation with the local officers of the civil service, through their departmental head and through the Secretariat. This general plan resembles that of British India; but in the Netherlands Indies the departmental organization has a larger place, the departmental officers are at least on the same footing as those of the civil service and, until recently, have been more highly qualified and better paid.

LOCAL GOVERNMENT

Politically it is necessary to distinguish between the government domain, under direct rule and solely under Dutch authority—such as

the government lands in Java or the Residencies of Lampoeng and Djambi in Sumatra—and the native states, under indirect rule. The native states differ greatly in area, population and political importance, but are all, in theory, ruled along native lines by their own princes or chieftains. In Java, the whole country is under direct rule, except for four native states in Soerakarta and Jogjakarta. In Sumatra the south and west are mainly under direct rule, and the north and east under indirect rule. In Borneo, almost the whole of the western province is under indirect rule. Celebes is all under indirect rule, except for small tracts round Makassar in the south and Manado in the north. All the rest of the archipelago is under indirect rule, except Bali, Lombok and the islands east of Timor, including Amboina, Ceram and Banda. Territories may be transferred from direct to indirect rule, or *vice versa*; within the last few years native states have been restored in certain islands.

In the native states the laws and regulations of the Netherlands Indies (*algemeene verordeningen*) apply only in so far as they are compatible with the right of self-government. Formerly the relations between the government and the native states were regulated in great detail in long contracts. Under the influence of Snouck Hurgronje, a 'short declaration' has ordinarily been substituted since 1898 (see p. 92). Within the next thirty years, out of a total of 282 states, all but fifteen had subscribed to the 'short declaration'. Rules governing relations with the native states under the 'short declaration' were published in 1919 and revised in 1927.

The political distinction between direct and indirect rule is, however, of legal rather than practical interest. For, in those parts under direct rule, it has always been and still is the Dutch policy to leave the people so far as possible under their own recognized or appointed heads, and in those parts under indirect rule the native ruler is expected to accept the advice of his Dutch adviser and has little freedom of action. Further, the authority of rulers of native states extends only over their own subjects, and not over Europeans, Foreign Orientals or natives other than their own subjects. Everywhere, whether direct or indirect rule prevails, matters relating to Europeans are dealt with so far as possible by European officials, and Foreign Orientals remain, so far as possible, under their own recognized or appointed heads. The political basis of the whole Dutch system is now, as in the past, the rule of 'like over like'.

In Java the native states and the tracts under direct rule fall into separate administrative units, but outside Java the same adminis-

trative unit may contain both areas under direct rule and areas under indirect rule. For many reasons it has long been the practice to distinguish Java and Madoera from the other islands, which are known collectively as the Outer Provinces; but this distinction has no basis in law. For administrative purposes the whole area is divided into *gewesten*. Until recently all the *gewesten* in Java and Madoera were termed Residencies; in the Outer Provinces the *gewesten* were ordinarily Residencies, but three of them regarded as more important were termed Governments. On this arrangement the Governor-General was the central focus of a large number of independent charges. The process of decentralization has reconstituted the administrative system on a new model based on that of the Netherlands, where the central provincial and local governments form an organic whole.

By the amendment of the Constitution of 1854 in the administrative reform act of 1922, it was provided that the territories of the Netherlands Indies should be distributed into 'provinces and other *gewesten*'. This provision was taken over in the new Constitution of 1925. The intention was to group the existing charges into larger units under Governors and, as circumstances allowed, to convert these Governments into Provinces, by making over purely local affairs to a provincial government, consisting of the Governor and a representative provincial council (see p. 117). In West-Java a Governor was appointed in 1925, and the Government was converted into a Province from 1 January 1926. Four other Governments were formed in Java in 1928: Midden-Java, Oost-Java, Soerakarta and Jogjakarta. Oost-Java was converted into a Province with effect from 1 January 1929, and Midden-Java from 1 January 1930. Soerakarta and Jogjakarta are native states and there is no intention of giving them a provincial form of government; it was chiefly out of consideration for the native rulers that the local Resident was given the more dignified title of Governor. In the Outer Provinces there was some delay in the introduction of the new model, owing to the difficulty of framing suitable units for rule along provincial lines, and an experiment in the constitution of a Government in the Moluccas in 1926 was regarded as unsuccessful. Finally, in 1938, three Governments were formed: Sumatra, Borneo and the Groote Oost. The Governors have been given representative councils, but these are purely advisory and the provincial type of government, with a responsible council, has not yet been introduced. Thus the *gewesten*, the major units of administration, are now either Provinces

or Governments, and the former Residencies, though still popularly known by that name, are technically no longer *gewesten* but Divisions (*afdeelingen*).

The Provinces and Governments of the Netherlands Indies with their area and population are given in the following table.

Gewest	Status	Area (sq. miles)	Population (millions)
West-Java	Province	18,100	11.4
Midden-Java	Province	10,876	11.1
Oost-Java	Province	18,503	15.0
Soerakarta	Government	2,332	2.5
Jogjakarta	Government	1,224	1.5
Sumatra	Government	182,862	8.2
Borneo	Government	208,282	2.2
Groote Oost	Government	293,095	8.6

Source: *Statistical Abstract of the Netherlands Indies*, 1940, pp. 2, 7 (Batavia, n.d.)
The population figures are for 1930.

Administrative Organization in Java and Madoera.

The three provinces of West-Java, Midden-Java and Oost-Java are each under a Governor, who is at once the agent of the central government and the chief executive of the self-governing provincial government (Fig. 9). The provincial council, over which the Governor presides, has a large measure of autonomy in local matters and also acts as the local agent of the central government. Most of the work of the council is ordinarily delegated to a small committee, termed the college of deputies (*Gedeputeerden*). The electorate for the provincial council consists of the members, elected and nominated, of the regency and urban councils. The Dutch and Foreign-subject members are each a single constituency; the native members are grouped in several constituencies, one for each Residency, with a varying number of representatives for each constituency according to its population. Where there is more than one member for a constituency, the election is by proportional representation. The usual qualifications for a member are that he shall be a male Dutch subject, twenty-five years of age, resident within the Province and possess a satisfactory knowledge of Dutch. As regards the nominated members, the local Governor submits two names for each vacancy, and the nomination is made by the Governor-General, after consulting the Council of the Indies.

Each of the Provinces of Java and Madoera is divided into Residencies, under European officials called Residents; there are subordinate European officers, the Assistant-Resident and the

Controleur (Inspector), but these have no independent charge and are merely assistants to the Resident. The Residencies are divided at present into seventy Regencies, which differ greatly in area and population; for example, Koedoes in Midden-Java has an area of



Fig. 9. The administrative divisions of Java

Source: *Atlas van Tropisch Nederland*, plate 19 (Batavia, 1938).

less than 250 sq. miles and Krawang in West-Java has an area of close on 1,950 sq. miles; Pandeglang in West-Java has a population of little over a quarter of a million and Malang in Oost-Java has nearly one and a quarter million. Each Regency is under a native official, the Regent. The Regency is subdivided into Districts, each under a district-head (*wedana* or *wedono*) and these into sub-districts, each under a sub-district head (assistant-*wedana*). Within each sub-district there are the 'native communities' (*inlandsch gemeenten*) or, popularly, villages (*desa*).

A regency council assist the Regent in his administrative duties. This council has similar powers to that of the provincial council; much of its work is carried out by a committee called the college of commissioners (*Gecommitteerden*). The elections for the native members of the regency council are indirect; the primary voters choose an elector for the members of the council. The usual qualifications for a native to vote are that he should be twenty-one years of age and entitled by village custom to vote in the election of the village headman. For every 500 inhabitants there is one elector. The usual qualifications for an elector are that he should be a male

local resident, twenty-five years of age, and able to read and write the vernacular in the Roman script. The nominated members of the council are chosen by the Governor of the Province from among two people recommended by the Regent for each vacant place. The proportion of nominated to elected members varies, but is ordinarily less than one-half.

The highest native official in the Regency after the Regent is the *patih*, a general assistant who may do most of the Regent's work. The *patih* is usually in charge of the district which includes the Regency headquarters, and the district officer similarly has charge of the sub-district that includes the district headquarters. These native officers, from the Regent downwards, constitute the Native Civil Service. Alongside them are officers of the European Civil Service. In each Regency there is an Assistant-Resident, who is directly subordinate to the Resident, but is merely the adviser of the Regent. Sometimes the Assistant-Resident has charge of more than one Regency; in that case he usually has an Inspector to help him in the out-station.

The Regent and district-head have petty criminal and civil powers which enable them to dispose, informally and summarily, of village disputes that the local elders cannot settle. But these magisterial and judicial powers are of very minor importance. Primarily all the administrative officers are officers of police, or rather, of policy; they are not servants of the law but agents of the state. They are indeed charged with the investigation and prosecution of crime, and the Assistant-Resident and Regent are both linked up with the field police (see p. 128). Their primary function is to give effect to the policy of the government, mainly by authoritative advice, admonition, encouragement and other forms of 'gentle pressure' (*printah aloes*). It is through this agency that the government promotes village schools, better agriculture, the care of cattle, sanitation, and hygiene.

Village Government. The village is the fundamental unit of administration in Java and Madoera. It has been a tradition of Dutch rule to abstain from interference in village affairs except in so far as the interests of the central government required. The village government consists of a headman and a number of subordinate officers. The headman has a double function. On the one hand he is the organ of social will in respect of internal economy and on the other hand he is the instrument of authority in matters in which the government is concerned. The right to vote in the election of a headman rests with those who were formerly subject to compulsory services

(*herendiensten*), or specially exempt therefrom. As the liability to render these services lay in some parts on the individual, in others on the household, and in others on the right to occupy village land, there is a great local diversity in the village franchise. This reacts on the constitution of local bodies of a higher order, such as the regency council, for which the primary electors are those entitled to vote for the village headman.

The constitution of the village government is formulated by the regency council, which also regulates the appointment and removal of the members and their remuneration, but in all these matters ordinarily follows village custom. The headman derives a part of his emoluments from a commission on the taxes which he collects for the central government, chiefly the land revenue; but he, and other members of the village government, are often remunerated by the assignment of land, and by custom are entitled to various services by the villagers. The village as a legal unit has its own institutions, finances, domains and other properties. The headman is responsible both for the good conduct of the villagers and for the welfare of the village. The village government is charged with the maintenance of village works, such as roads, bridges, building, markets, irrigation channels, and tanks, and with the administration of village lands, so far as these are not held in individual possession. Each village is expected to prepare a budget and keep accounts. For matters of importance there must be a general village assembly, duly summoned by the village government, and a record of its proceedings is kept to show the number present, and the result of votes taken. Gradually, however, many officers came to hold that much of the procedure was far too elaborate, and that the ordinary villager had little interest in amenities which European officials regarded as conducive to village welfare, and urged on the people by the exercise of 'gentle pressure'. There has therefore been a reaction of recent years in favour of leaving the villages to manage their own affairs with less interference by officials. Thus the village community is now regarded as of little value as an instrument of uplift, and, moreover, under modern influences old corporate tradition is weakening. At the same time it is difficult to abstain from intervention. Departmental subordinates of the agricultural, veterinary, credit, education, public health and other services need the assistance of officers of the administrative civil service, without whose help they can accomplish little; in the interests of the general public it is necessary to enforce a common minimum of social welfare which the people themselves do not appreciate.



Plate 28. Offices of the Preanger Resident, Bandoeng



Plate 29. Offices of the Governor of Oost-Java, Soerabaja



Plate 30. Town Hall, Medan

Officers of the civil service, therefore, if less enthusiastic and optimistic than before, are little if at all less active in their dealings with the village; in these activities, however, European officers tend to play a smaller, and native officers, a larger, part.

Vergaderingen. The chief instrument of government policy in Java and Madoera is the *vergadering*, or assembly. At least twice a year, and usually once a month, the Resident holds a *vergadering*, attended by his European and native subordinates, and such departmental officials as he may invite to discuss administration and policy. About once a month the Regent holds a similar *vergadering*, attended by his native subordinates, to which the Assistant-Resident (and Controleur, if there is one), and also the local departmental subordinates, are invited. Similarly once a week, the sub-district head holds meetings of his village headmen. All down the scale, representatives of the various departments, charged with agriculture, cooperation, veterinary work and so on, have opportunities in the *vergadering* of explaining what the government is trying to do for the people, and how the people can help; and the local administrative officer is present to support them with his authority.

Municipal Government. The first municipalities were created in 1905, but the transfer of functions and powers to them was a slow and gradual process. In the present structure of government, as laid down in the Constitution of 1925, the municipalities occupy a position similar to that of the Regency. The municipalities are governed by councils, each with a mayor at its head, which differ from the provincial and regency councils in all of its members being elected. The elections for the council are direct and by separate communities. The usual qualifications for an elector are that he should be twenty-one years of age, a resident within the urban area, and able to read or write Dutch, Malay or the local vernacular, and possess an income of at least f 3,000. The election in the Dutch and Foreign-subject communities is by proportional representation from among a published list of candidates; in the native community, the election is by a simple majority and the town is, if necessary, divided into electoral areas with one member for each area.

Administrative Organization in the Outer Provinces

In the Outer Provinces the spirit of the administration is similar to that in Java but the form is different. Geographical and other considerations enhanced the difficulty of forming Governments and Provinces on the same plan as in Java; only in certain localities were

there historic units on a smaller scale corresponding to the Regencies of Java; and in most places the unit of social life was the tribe and not the village as in Java. The three Governments of Sumatra, Borneo and the Groote Oost, as constituted in 1938, are formed of a number of Residencies divided into two or more Divisions, each under an Assistant-Resident (Fig. 10); and these again comprise sub-divisions, each under an Inspector, or a European officer locally recruited and of lower status, the *Gezaghebber*. These are all officers of the European Civil Service, and they discharge the functions which in Java are distributed between the European and Native Civil Service. In most Residencies in the Outer Provinces, there is a Native Civil Service, corresponding loosely to that of Java, but purely official and without hereditary ties or claims. This Native Civil Service links up the European Civil Service with the local native communities, often tribal rather than territorial. The subdivision may comprise one or more states (*landschappen*)—though exceptionally a large *landschap* may cover more than one subdivision—or a larger or smaller number of native communities under their customary heads. For linking up the native community with the government the machinery is very similar to that of Java, with an ascending scale of *vergaderingen*.

The rural councils that formerly existed in many parts of the Outer Provinces are being remodelled as Urban Communities (*Stadsgemeenten*) or else absorbed in Group-Communities (*Groepgemeenschappen*). Some of these new Group-Communities cover the whole and others merely parts of a Residency. The council in the Group Community is autonomous in respect of local affairs, and has some right of supervision over any urban councils within its jurisdiction. In those areas, therefore, where it is possible to constitute Group-Communities, there is a quasi-organic system of local autonomy on much the same general lines as in Java. In some regions such councils are unsuitable, though it is nevertheless desirable to relieve the central government so far as possible from the care and charges of local administration. To meet this difficulty such areas are being constituted as autonomous tracts (*landstreken*) with separate finances, but with control of local affairs managed by the local representative of the central government. This course of reforms, which only began in the middle of 1938, is being gradually extended, but it is not yet complete.

In the Outer Provinces there is a wide variety of local groups, sometimes of greater importance and covering a much wider area than the village in Java. The new Village Ordinance for the Outer

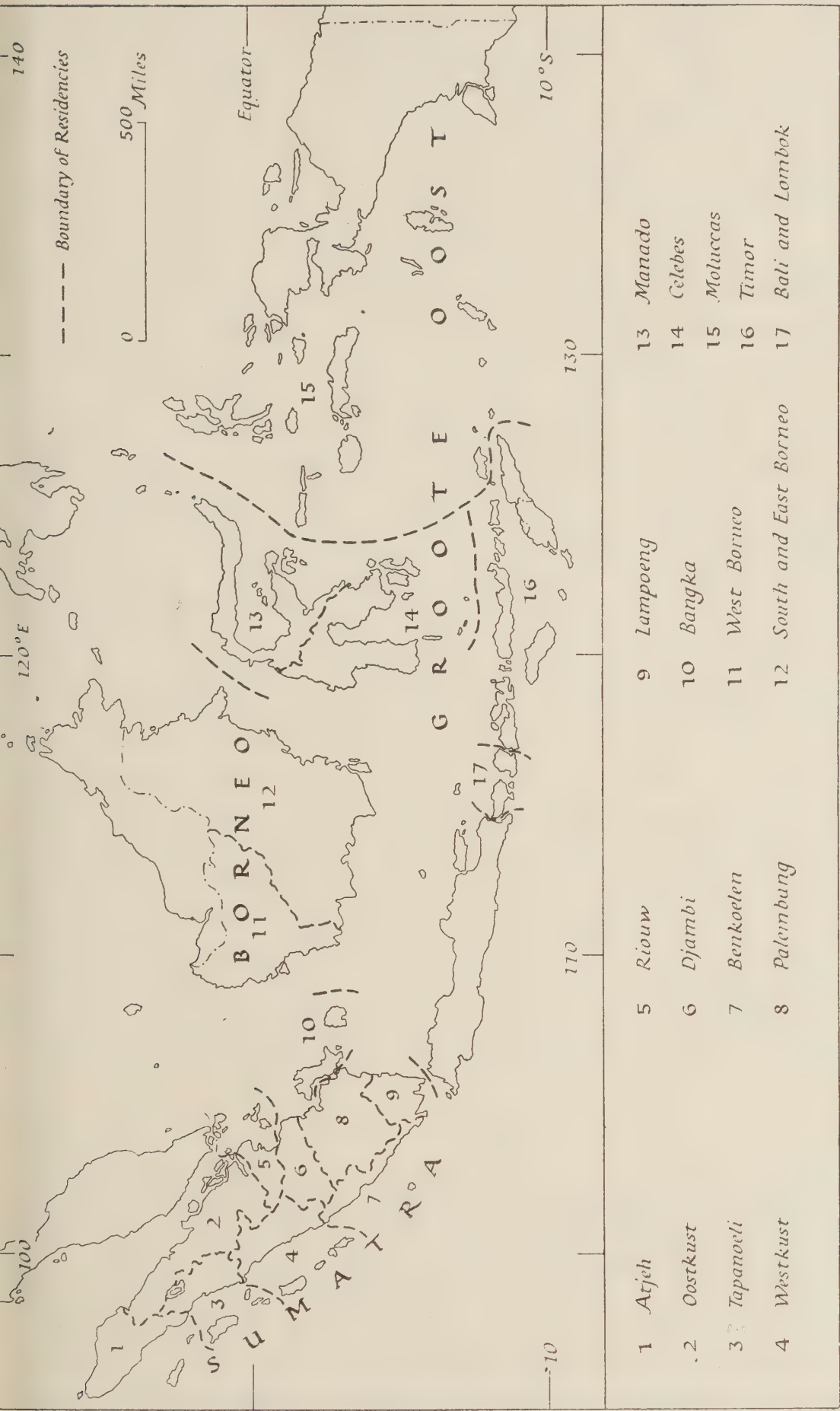


Fig. 10. The administrative divisions of the Outer Provinces or Java, see Fig. 9.
Source: *Atlas van Tropisch Nederland*, plates 9, 11, 23 (Batavia, 1938).

Provinces, which took effect from 1 January 1939, distinguishes the traditional and the modern types of village and at the same time it makes provision for the transformation of the one into the other. The traditional village, as in Java, is endowed with a legal personality; the headman and other officers are appointed in accordance with rules formulated by the Resident with regard for local custom; the headman is responsible to the central government for the maintenance of law and order, but the constitution and powers of the village officers and the village are determined by custom, subject to the power of the Resident to overrule any measure contrary to official regulations or the general welfare; the village may also be empowered to impose taxes. Should the village express a wish to be transformed into a modern village, the change is notified by the Governor. Thereupon the village government is vested in the headman and village council, with the headman as chairman and executive. The council holds meetings open to the public. Its resolutions only take effect after registration by the local sub-district officer, who must satisfy himself that they are not invalidated by any irregularity of procedure. The council can raise taxes for the cost of administration, and for educational and other purposes. It is required to frame a budget and to maintain accounts. All moneys accruing to the village must be paid into a village treasury. The council can also frame regulations imposing penalties up to three days' imprisonment or a fine of *f* 10. Before rules imposing taxes or penalties are passed, the council must hear objections in a public assembly (*volksvergadering*). Such regulations are submitted for approval to the Resident, who must consult the Group-Community or other higher organ of local government, if such exists; they are then given the force of law by publication in the general village gazette. Thus the Village Ordinance for the Outer Provinces aims at accomplishing for selected villages what the old Village Ordinance attempted for all villages in Java.

LEGAL SYSTEM

The legal system, like the other branches of the administration in the Netherlands Indies, reflects the Dutch tradition of indirect rule, though in some respects the arrangements differ for the three main classes: Europeans, Natives and Foreign Orientals. Although the principle of equal law and identical courts for all classes has never been accepted, all have alike been subject since 1918 to a common penal code; differences, however, persist in criminal procedure.

For Europeans the civil law follows closely the Dutch law, and the same law is applied to individuals, natives or other orientals, who are registered as Europeans. Civil law for natives is their customary law. Civil law for Foreign Orientals is likewise, in principle, their customary law; but those cases that come before the courts deal mostly with commercial matters, to which the European codes apply, so that little of their customary law remains.

The organization of the judiciary exhibits a corresponding diversity. The main distinction is between courts which administer justice in the name of the Crown, of which some deal with natives according to their customary law (*inlandsche rechtspraak*), and those which derive their authority from the native community (*inheemsche rechtspraak*). Thus there are Government Courts with jurisdiction over Europeans; Government Courts with jurisdiction over natives; and Native Courts. Government Courts, both for Europeans and natives, may be found within the native states, and Native Courts may be found within the government domain. There are also Muslim Courts and Military Courts. Altogether, in the words of a leading Dutch jurist, there is a 'bewildering variety' of law and law courts. All that is here possible is to summarize in broad outline the main features of the system, neglecting minor racial or local differences.

High Court of Justice

The High Court of Justice (*Hooggerechtshof*) is the supreme court. It is the court of first instance in cases where high officials are prosecuted on criminal charges, but its ordinary activities relate to general supervision over judicial administration, either by admonitions, or by the trial of cases on appeal, or in revision on points of fact, or in cassation on points of law. It consists of a President, Vice-President and six members. Attached to it is the Procureur-General, who plays an important part in general police administration in direct subordination to the Governor-General. He is the head of the organization charged with the prosecution of offenders, which works through officials (judge-advocates or court-prosecutors) attached to the lower courts; he is also the head of the judicial police, that is, the police concerned with the investigation of offences and can give instructions to the administrative police, that is, the Residents and their subordinates.

Courts of Justice

There are six Courts of Justice (*Raden van Justitie*), three in Java

and three in the Outer Provinces; in each there is a bench of judges who must all be professional lawyers. Since 1917 membership has been open to natives, but in 1941 there was only one native member. These courts hear in the first instance cases where either party is subject to European law, and which are above the competence of lower courts; also the more important criminal prosecutions against Europeans. They hear civil appeals from Europeans and natives; on the criminal side they hear cases on appeal or revision from natives and Foreign Orientals, and also appeals by Europeans from sentences of lower courts in the Outer Provinces so far as a right of appeal exists.

Residency Courts and Native Benches

The Residency Court (*Residentiegerecht*) and Native Bench (*Landraad*, or *inlandsche rechtbank*) are the next grade. In the Residency Court a single judge, with the assistance of a bench-clerk or registrar (*griffier*), decides civil cases concerning Europeans up to a value of f 1,500; in parts of the Outer Provinces, he also tries minor criminal charges against Europeans. He should be a professional lawyer, though in the Outer Provinces he may be a member of the civil service. About half these judges are Europeans and the rest natives, including one or two Chinese.

The same officer presides over the *Landraad*, which is the ordinary court of first instance in the civil suits of natives, and also tries criminal charges (except for petty misdemeanours) against natives and Foreign Orientals. The other members of the bench are usually natives; in the larger towns they may be permanent and paid, but elsewhere they consist of local dignitaries. In districts where there are many Chinese, some members may be Chinese, and in the European centre is the Oostkust Residency of Sumatra, there are European members. Together with them sit a prosecuting magistrate (*djaksa*), often termed a native officer of justice, and a *griffier*.

In Java there is a *Landraad*, and consequently a Residency Court, at the headquarters of each Regency, but the President is usually in charge of two, or even three courts. In the Outer Provinces there is one or more such courts in each Residency.

Police Courts

Next below the *Landraad* come the Police Court (*Landgerecht*). In these courts the magistrate, sitting alone but with the assistance of a native official entitled the *fiscaal griffier*, disposes summarily of

petty misdemeanours, irrespective of the race of the accused. The magistrate is either a member of the judicial service or a local administrative officer of the European civil service, but an officer of the native civil service may act as an additional magistrate. Sometimes retired officials are appointed. In some places in the Outer Provinces the place of this court is taken by a magistrate's court (*magistraatsgerecht*) in which the presiding officer has similar powers but also tries petty civil cases. The procedure in the *Landgerecht* is very summary, and there is no appeal against its sentences, but the High Court may inspect its registers.

In Java there is a police court at the headquarters of each Regency, but the magistrate also tries cases at other places while on tour. In the Outer Provinces the arrangements are generally similar.

Petty Government Courts

The Regency and District Courts in Java are of a subordinate standing and there are corresponding courts in the Outer Provinces. These dispose, in a very informal manner, of petty civil cases between natives, and petty cases of theft and mischief. In the Regency Court the Regent, represented sometimes by his head assistant, the *patih*, gives the decision, but seated with him as assessors are such local dignitaries as custom prescribes, and also the *djaksa* (court prosecutor) and the Regency cleric (*panghoeloe*). An appeal against the decision can be made to the *Landraad*. The District Court resembles the Regency Court, but is presided over by the head of the District, and has even smaller powers. Appeals can be made to the Regency Court. In the Outer Provinces the corresponding courts are often native courts, deriving their authority from the native ruler or from custom; such courts may have wider powers over the natives than the Regency and District Courts in Java.

Religious Courts

All civil cases between Muslims, so far as customary law (*adatrecht*) prescribes, come before the religious court, except where otherwise provided by ordinance. The religious court of first instance is the *Priesterraad*, attached to each *Landraad*, and with the same jurisdiction. Its scope is restricted to such matters regarding marriage and divorce as require the intervention of the religious court. The court consists of a Bench, with the head *panghoeloe* as president and three to eight Muslim notables as members. An appeal can be made to the

Court for Islamic Affairs, which sits at Batavia, and consists of a president with two members and with the assistance of a *griffier*.

Military Courts

For the trial in the first instance of criminal charges against soldiers and sailors there are special courts, respectively the *Krijgsraden* and *Zeekrijgsraden bij den Landmacht*. An appeal lies from these courts to the High Military Court (*Hoog-Militair-Gerechtshof*) in Batavia, which also takes cognizance in the first instance of charges against officers of specified higher ranks.

POLICE SYSTEM

Until quite recently there was no police service apart from the civil service and their orderlies, the *bestuurspolitie*, who were largely ornamental. In addition to these there was in every village a village policeman, subordinate to the headman, and there were also special guards for the protection of forests and plantations; moreover the villagers had to serve their turns in watch and ward. Not until 1897 was there a first attempt to create a police force, the General Police, but most of the men still remained attached to civil officers. Then, in 1911, the growth of unrest, consequent on the nationalist movement, led to the formation of a Town Police. Up-country the civil officers still depended on the *bestuurspolitie*; but although these grew in numbers, disaffection grew still faster, and many tracts were getting out of hand. In 1921, therefore, a regular police force was organized for rural areas, the Field Police, similar to the Town Police and, like them, forming a part of the General Police. In Java each Regent within his Regency is nominally the head of the Field Police; but control and administrative routine rest with the Assistant-Resident, and drill and discipline with a special officer, ordinarily a European inspector, who is in charge of thirty to fifty men. The investigation of crime, however, still rests in the first instance with the village police. If the Regent wishes to employ any of the regular police, he must ask the Assistant-Resident to place them at his disposal, when the Assistant-Resident is bound to comply with his request. In the Outer Provinces the police organization is in general similar, but there is also a military police, recruited mainly in Manado and Amboina, charged with quasi-military duties in areas that are not as yet completely pacified.

BIBLIOGRAPHICAL NOTE

1. A general account of the administrative organization is given in the following works: R. Emerson, L. A. Mills and Virginia Thompson, *Government and Nationalism in South-East Asia*, Institute of Pacific Relations (New York, 1942); J. S. Furnivall, *Netherlands India* (Cambridge, 1939); *Handbook of the Netherlands East Indies*, 1930 (Buitenzorg, 1930); J. H. Heslingen, *De nieuwe Indische staatsinrichting* (Weltevreden, 1928); H. J. van Mook, *De organisatie van de Indische Regeering* (Batavia, 1932); Amry Vandenbosch, *The Dutch East Indies* (Berkeley, 1941).
2. For administrative regulations see the *Regeerings-Almanak van Nederlandsch-Indië*, published annually at Batavia.
3. There are a number of articles relating to administrative problems in B. Schrieke, (ed.) *The effect of Western influence upon native civilizations in the Malay Archipelago* (Batavia, 1929).
4. The characteristics of village government are described in L. Adam, *De autonomie van het Indonesisch Dorp* (1924) and in F. A. E. Laceulle, *Eindverslag over het Desa-Autonomie Onderzoek* (Batavia, 1929).
5. The reform of administration in the Outer Provinces is dealt with in E. J. Burger, 'Het Zelfbekostings-beginsel in de Buitengewesten' *Koloniaal Tijdschrift*, 1939, p. 196 ('s Gravenhage, 1939) and in F. van Mourik, 'De verdere doorvoering van de Bestuurshervorming' *Koloniaal Tijdschrift*, 1939, p. 282 ('s Gravenhage, 1939).

Chapter V

GROWTH AND DISTRIBUTION OF POPULATION

General Features: Distribution of Population: Growth of Population: Immigration, Emigration and Colonization: Rural Settlement: Towns and Cities: The European Population: The Chinese Population: The Arab Population: Bibliographical Note

GENERAL FEATURES

In 1930, the date of the last census, the Netherlands Indies had a population of 60,727,233 or over seven times that of the mother country and one-quarter larger than that of Great Britain. On the basis of the total area of 735,268 sq. miles the mean density is 83 per sq. mile, but the distribution and density of population is so uneven as to make this figure of little significance. Two-thirds of the whole population lives in Java and Madoera and here there is a mean density of 817 inhabitants per sq. mile. On the other hand the corresponding figure in Sumatra is 44, in Borneo 12, in Celebes 56 and in Dutch New Guinea under 5 per sq. mile.

The population is composed of three main groups: Natives, Europeans and Foreign Orientals. The relative numbers of these groups in each of the main political divisions are shown in the table below.

	Natives	Europeans	Foreign Orientals		Total
			Chinese	Others	
Java & Madoera	40,891,093	192,571	582,431	52,269	41,718,364
Sumatra	7,745,227	28,496	448,552	32,568	8,254,843
Borneo	2,017,072	5,639	134,287	11,663	2,168,661
Celebes	4,173,603	7,683	41,402	9,218	4,231,906
Lesser Soenda Is.	3,434,944	1,528	17,816	5,771	3,460,059
Moluccas	563,483	4,296	7,454	3,896	579,129
New Guinea	312,645	204	1,272	150	314,271
	59,138,067	240,417	1,233,214	115,535	60,727,233

Source: *Indisch Verslag*, 1938, vol. II, pp. 12-15 (Batavia, 1938)

The native groups, which form by far the highest proportion of the total population, include a vast number of peoples, such as the

Javanese, Atjeher, Batak, Boeginese and Papuan, varying greatly in physical character and in cultural development (see pp. 1-31). The large Chinese population is concentrated chiefly in the towns and in the mining and plantation districts of Java and Sumatra. Foreign Orientals, other than Chinese, are relatively unimportant in Java, though in most of the other islands they far outnumber the European population. In the older centres, such as Amboina and Makassar, they are fewer in number than the Europeans, mostly Eurasians, and all along the west coast of Sumatra, from Atjeh to the Lampoeng Residency, Europeans predominate; but elsewhere Foreign Orientals take the lead even in busy centres of European enterprise. The name 'European' refers to all those with the legal status of Europeans; 7,195 Japanese, 282 Filipinos, 130 Turks and 8,948 natives were amongst those enumerated as 'Europeans' in 1930.

As in other regions of south-east Asia most of the population lives in rural areas. The proportion of urban dwellers is about 5%. Only six cities in Java and Madoera—Batavia, Soerabaja, Semarang, Bandoeng, Soerakarta and Jogjakarta—have populations of over 100,000; in the Outer Provinces Palembang is the only city of this size.

Occupation Groups

In 1930 the numbers gainfully employed amounted to 20.9 millions out of a total population of 60.7 millions. The chief occupations of the different communities are given in the following table.

Numbers employed in Occupational Groups, 1930 (in thousands)

Occupation	Natives		Europeans		Chinese		Other Orientals		Total No.
	No.	%	No.	%	No.	%	No.	%	
Production of Raw Materials	14,193.2	70.6	18.8	22.0	144.9	30.8	7.0	19.4	14,363.9
Industry	2,105.1	10.3	4.7	5.5	93.9	20.0	5.0	14.0	2,208.7
Transport	290.7	1.3	10.9	12.9	12.7	2.7	1.7	4.7	316.0
Commerce	1,090.9	5.3	11.4	13.2	171.9	36.6	19.0	52.8	1,293.2
Liberal Professions	150.2	.7	11.3	13.2	7.2	1.5	.8	2.3	170.2
Public Administration	491.9	2.3	20.7	24.3	3.0	.7	.5	1.4	516.1
Others	1,957.6	9.5	7.4	8.8	36.1	7.7	2.0	5.4	2,003.1
Total	20,279.6	100.0	85.3	100.0	469.9	100.0	36.1	100.0	20,871.2

Source: *Indisch Verslag*, 1938, vol. II, p. 64 (Batavia, 1938).

Over 60% of the gainfully employed population is occupied in cultivating the soil and in mining operations. Industry, with rather more than 10%, comes next to the production of raw materials in the list of occupations; the remaining occupation groups employ relatively small numbers of workers.

The basic contrast between native and non-native communities is also brought out in the table of occupation groups. Among natives 70% are engaged in the production of raw materials and only 30% in other occupations, whereas in the Chinese community these proportions are exactly reversed, and in the other communities the proportion engaged in the production of raw materials is still lower. Again, commerce occupies over a third of the Chinese and more than half of the Foreign Orientals, while practically one-quarter of the Europeans are engaged in public administration. Closer examination of some of the heads points the contrast more effectively. The native share in the production of raw materials is almost restricted to native agriculture, while plantation agriculture occupies two-thirds of the Europeans. The Chinese are almost equally divided between native and plantation agriculture, with as many engaged in mineral production, and many of them are horticulturalists. In commerce, Europeans have practically a monopoly of the wholesale business; among the miscellaneous petty traders there are nearly as many Chinese as natives, although the latter are fifty times as numerous. The Chinese and other Foreign Orientals monopolize the clothing trade.

DISTRIBUTION OF POPULATION

Contrast is the keynote to the distribution of population in the Netherlands Indies. More than 60% of the population is concentrated in Java and Madoera, the remainder being scattered very widely over a considerable number of large and small islands. Java has a mean density of over 500 persons per sq. mile, whereas elsewhere only a few small areas, such as the islands of Bali and Lombok, the district of Padang in Sumatra and the Makassar region in Celebes, show a density of as much as 350 per sq. mile. Moreover, in the Outer Provinces there are vast areas, especially in Borneo and New Guinea, either completely uninhabited or with less than one person per sq. mile (Fig. 11).

The reasons for this striking population distribution are to be found in the variable relief and soil characteristics, as well as in the

differences in historical and economic development of the islands. The great concentration of population in Java is partly related to the distribution of recent volcanic soils, the fertility of which has allowed an intensive land utilization, and partly to the existence of favourable conditions for irrigated rice cultivation. Further, the regular incidence



Fig. 11. Distribution of Population in the Netherlands Indies

Source: *Volkstelling, 1930 (Voorloopige Uitkomsten) Buitengewesten* (Batavia, 1931).

of the monsoons in this island ensures the growth of subsistence crops, so vital a factor for a population largely if not entirely dependent on the soil for its livelihood. In respect of these physical conditions, Java is favoured above all the other islands, excepting perhaps the two small islands of Bali and Lombok. Physical factors alone, however, cannot account for the present-day distribution of population. Java has benefited far more than the rest of the East Indies from the many economic developments, such as the improvement of irrigation methods, the establishment of a successful plantation agriculture, the growth of modern manufacturing industries and the construction of a network of roads and railways, introduced by the government since the middle of last century. In addition to these economic advantages, Java has also enjoyed a longer period of political security and of improvements in social life than the other islands. To such factors, taken in conjunction with the physical conditions, may be attributed the high density of population in Java and the relatively low density in the Outer Provinces.

Distribution of Population in Java and Madoera

Java, with the adjacent island of Madoera, is one of the most densely peopled countries of the world with a population in 1930 of 41·7 millions and a mean density of 817 per sq. mile. This density is greater than that of Belgium, the most densely populated European country, where there are 712 per sq. mile. It is also equal to the most thickly peopled regions of India, China and Japan. Fig. 12 shows the distribution of population according to the census of 1930 on the basis of the 431 administrative districts into which the island is divided. From this it is seen that notable deviations from the mean density occur ; thus, a density of well under 700 per sq. mile is found in the mountainous country of southern Bantam, whilst figures as high as 3,000 per sq. mile are met with in parts of the northern coastal plain and in the native states of Soerakarta and Jogjakarta.



Fig. 12. Distribution of population in Java

Source: Folding map at end of *Volkstelling, 1930 (Voorloopige Uitkomsten), Java en Madoera* (Batavia, 1931).

The population of the island is predominantly rural and there is a marked correlation on the one hand between the density of the rural population and the percentage of land under cultivation in a particular district; and on the other, between this density and the area of cultivated land under rice (*sawah*). In almost all the administrative districts where the population is under 350 per sq. mile the land under cultivation is less than 30% and the *sawah* less than 9% of the total area. On the other hand, where the density is 3,000 per sq. mile or over, the cultivated land is more than 50% of the total area and the *sawah* more than 40%. Owing to differences in soil types over small areas, exceptions are found to this general statement, high figures

appearing among very low ones and similarly low ones amongst high ones.

In 1930 the urban population of Java and Madoera numbered less than three and a half million or only about 8% of the total population. Nearly two-thirds of this number lived in the six towns with over 100,000 inhabitants, namely Batavia, Soerabaja, Semarang, Bandoeng, Soerakarta and Jogjakarta in order of size.

Western Java

The western part of Java between Soenda strait and the meridian of Cheribon has rather under one-quarter of the total population. Some of the highest and some of the lowest rural densities are found here, while on the north coast of this region is Batavia, the capital and largest city in the island. Other large towns are Buitenzorg, Bandoeng, and Cheribon.

In the northern coastal plain of western Java, extending from Serang eastwards to the limits of the region, the population lies along or near the large rivers and principal highways and also in a strip of varying width at the edge of the mountains above the level of the river alluvium. Batavia (533,015 with its suburb Meester Cornelis) is situated at the mouth of the Tjiliwoeng, one of the many rivers entering the Java Sea. It has large manufactures and is an important centre of road and rail communications. In the low-lying districts adjacent to the sea west of Batavia is a fairly dense rural population with extensive areas under rice. But east of the capital, as far as the Tjimanoeck valley, there is a relatively thin population close to the coast, owing to the presence of marshlands, though the density remains high in the more elevated parts some distance from the sea. Further east, near the town and port of Cheribon (54,079) are found some of the highest rural densities in the whole of Java. Thus, in the district of Ploembon there is a density of 4,000 per sq. mile. The high proportion of land suitable for irrigated rice cultivation has largely contributed towards the concentration of population in this district, but other factors need to be taken into consideration. Sugar-cane has been grown here since the first half the nineteenth century, while in recent years the cultivation of groundnuts as an export crop has become important. In addition, many of the inhabitants of the Ploembon district derive their means of livelihood from industry, notably from the manufacture of textiles and tobacco.

The discontinuous belt of volcanic mountains south of the northern coastal plain is characterized by great contrasts in population density.

The mountainous region of western Bantam, which is separated from the main highland belt by low plains, is in general thinly peopled. The district of Menes has a density of 500 per sq. mile and that of Tjibahoeng, only 75 per sq. mile—the lowest figure of any district in

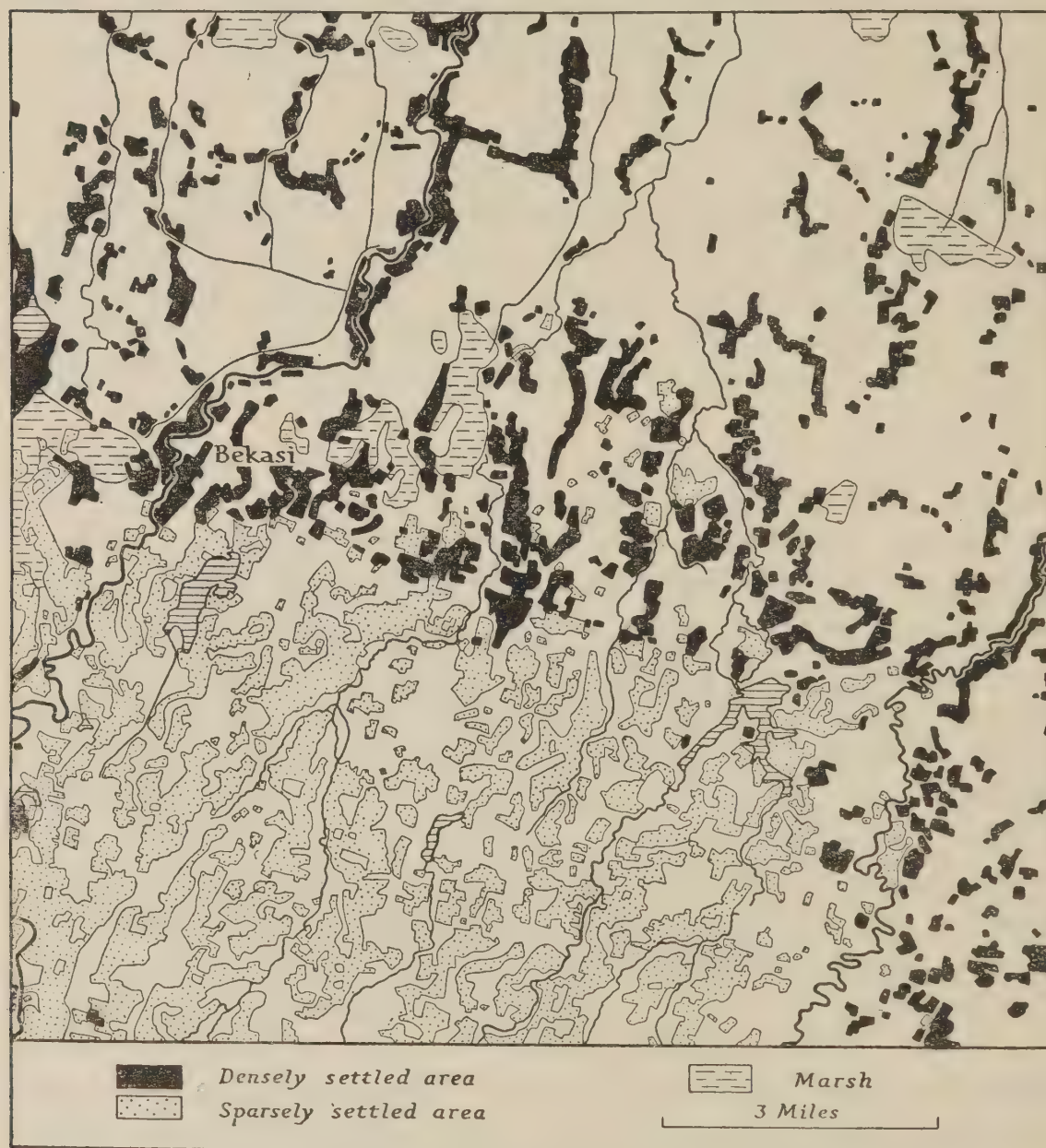


Fig. 13. Settlements in the coastal plain of Java east of Batavia

The northern coastal plain of western Java consists of two roughly parallel belts, an older one, sometimes referred to as 'Quaternary terraces', at higher elevation, on the south nearest the mountains, and a more recent one, little above sea-level, nearest the coast. In this figure the area of small and scattered settlements lie in the former belt, the large and more concentrated settlements being confined to the latter belt. Rice fields cover a much smaller part of the surface of the 'Quaternary Terrace' than of the lower belt nearer the coast. The small town of Bekasi lies on the dividing line between the two parts of the plain.

Source: *Java and Madura*, 1 : 50,000, sheet No. 37/xxxvii-D, G.S.G.S. 4202.

Java. The thinness of the population is due primarily to the poverty of the soil which is here derived from volcanic ejectamenta of high acid content, that is, containing much silicic acid and little lime and iron. Moreover, these districts have a heavy annual rainfall which leaches the soil thoroughly, making it less rich in plant nutrients and so less able to support a dense population. The volcanic region between Lebak and Goenoeng Salak is also thinly peopled, but from here eastwards to G. Tjareme the settlements are densely grouped around the slopes of the volcanoes and in a number of old lake basins. Soil conditions have played an important part in this distribution pattern.



Fig. 14. Settlements on the slopes of G. Tangkoebanprahoe

Source: *Java and Madura*, 1 : 50,000, sheet No. 39/xxxix-A, G.S.G.S. 4202.

The volcanic ash soils are basic in character and contain much lime, iron and potash; their fertility has attracted a large population. In general terms, the younger the soil the higher the density. The northern slopes of G. Tangkoebanprahoe have rather senile soils and support a population of less than 750 per sq. mile, while the soils of the southward facing slopes are relatively young and the density rises to over 1,500 per sq. mile (Fig. 14). Thus, the district of Lembang, at an elevation of over 4,000 ft. on this mountain, has 1,700 per sq. mile, and that of Tjimahi, 1,500 ft. lower, a density of 2,200 per sq. mile. Similar high densities, ranging from 1,000 to 2,000 per sq. mile, occur on the slopes of G. Pangrango and G. Tjareme, to the

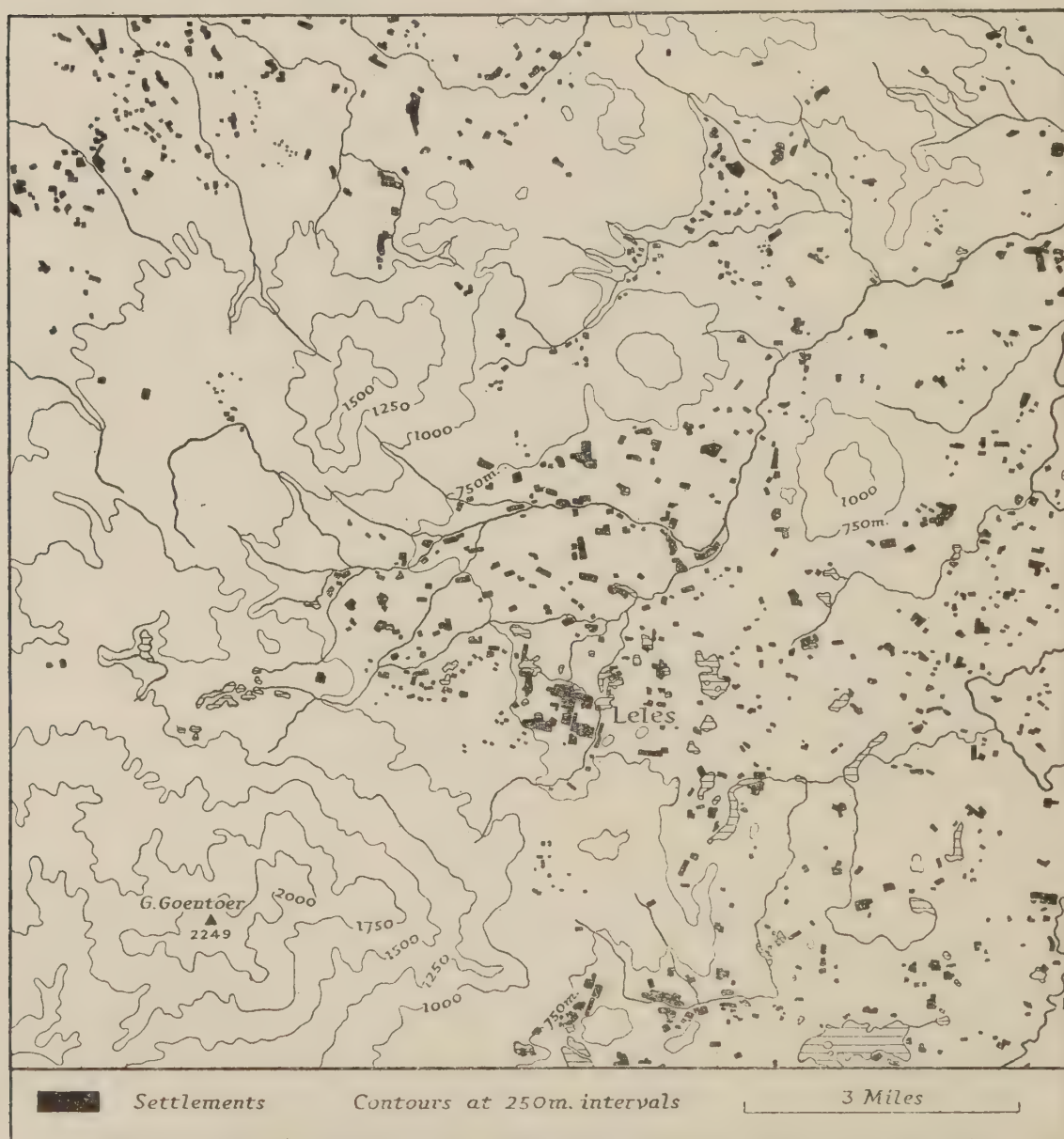


Fig. 15. Settlements in the upland basin of Garoet

The small town of Leles lies about ten miles north of Garoet.

Source: *Java and Madura*, 1 : 50,000, Sheet No. 40/XL-A, G.S.G.S. 4202.

east and west respectively of G. Tangkoebanprahoe. The fertile old lake basins of Bandoeng and Garoet, and the gaps cut by the rivers between the volcanoes, are also well populated. The development of roads and railways has been a not unimportant factor affecting the settlement of these areas. Buitenzorg (65,431), commanding the narrow gap between G. Salak and G. Pangrango, and Bandoeng (166,815), in the upland plain of the same name, are the largest towns in western Java after Batavia.

The mountainous country in the southern part of western Java is formed of Tertiary sandstones, marls and limestones which have, in the main, proved repellent to human settlement. The heavy annual rainfall of this region, moreover, increases the poverty of the soil. As a result of these circumstances no part has a density of over 750 per sq. mile.

Central Java

This region includes the province of Midden-Java, the native states of Jogjakarta and Soerakarta and the western part of the province of Oost-Java, as far east as Soerabaja. Over half of the population of the island dwells here and in parts there are very high densities. Four towns, Soerabaja, Semarang, Soerakarta and Jogjakarta, have over 100,000 inhabitants, while a number of others have populations of over 50,000.

A belt of dense population extends along the northern coastal plain with special concentrations in the residencies of Tegal, Pemalang, Pekalongan and Semarang. The district of Adiwerno near Tegal is the most densely peopled rural district in Java; it has a density of 6,200 per sq. mile. The low-lying plains around Pekalongan also have population densities of over 4,000 per sq. mile. The same factors that have led to the growth of a large population in the Cheribon region of western Java operate here. Irrigated rice cultivation is practised on an extensive scale and sugar-cane growing is also carried on; as in the former region, a great many persons are engaged in native industries, particularly the manufacture of textiles. The town and port of Semarang (217,796) is the capital and chief market centre of the province of Midden-Java. North-east of the city the landscape is dominated by the almost circular volcanic mass of G. Moerjo. A girdle of settlement fringes its lower slopes and certain parts have very high densities; there are 3,500 per sq. mile in the Koedoes district. The coastal plain between this mountain and Madoera strait is less densely peopled than the plain further west; thus, the district of Toeban has a

density of 1,200 per sq. mile. In the neighbourhood of Soerabaja the population density is frequently more than twice this figure. Soerabaja (341,675), which lies at the most northerly mouth of the Kali Brantas, is the first port and the second largest city of Java. It is also an important manufacturing centre.

In the interior of central Java the chequered pattern of population density is conditioned by the varied nature of the land-forms and

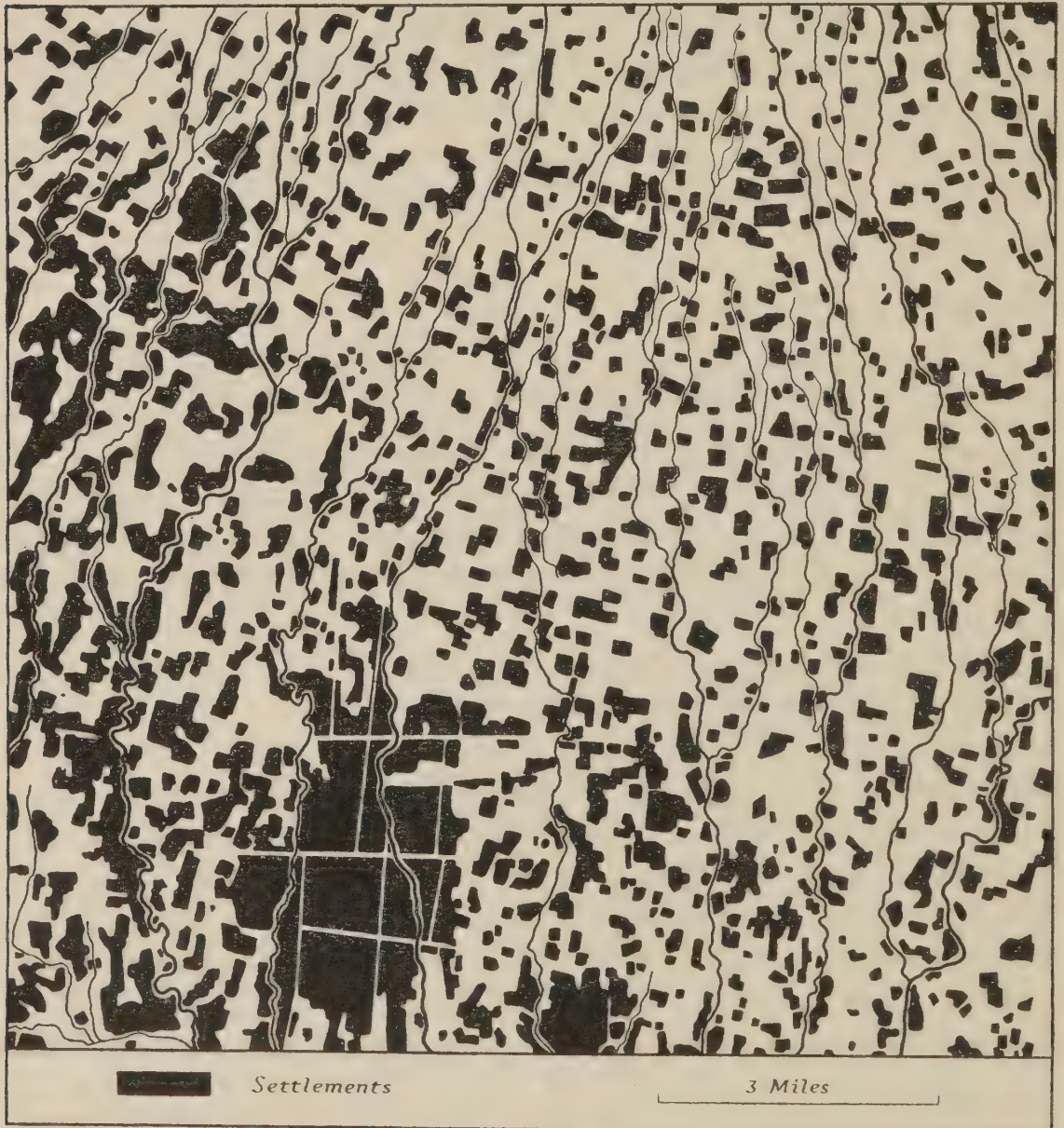


Fig. 16. Settlements in the plains near Jogjakarta

The highest density of population in the whole of Java is found in this region, where the fertile volcanic soils derived from the eruptions of G. Merapi provide excellent conditions for an intensive agricultural development. The town of Jogjakarta, with a population of 136,649 in 1930, is shown near the bottom margin of the map.

Source: *Java and Madura*, 1 : 50,000 sheet No. 47/XLII-B, G.S.G.S. 4202.

soils. The volcanic mountain mass of G. Slamet (11,480 ft.) in the extreme west of the region is thickly settled up to a height of about 3,000 ft., its fertile ash soils providing excellent conditions for the growth of subsistence crops. The district of Keboemen to the south and that of Boemiajoe to the west of this mountain have densities of 3,000 and 1,700 per sq. mile respectively. South of G. Slamet is the Banjoemas or Kali Serajoe basin in which the density averages about 2,700 per sq. mile, but between this upland basin and that of Magelang some 50 miles to the east is the relatively sparsely peopled upland region of the Dijëng plateau, and the two volcanoes, G. Soendoro and G. Soembing. The sparsity of settlement may be attributed to the high annual rainfall, which is greater here than in most other districts of Java, as a consequence of which the soils have suffered severe leaching and so cannot support a large population. As already noted, similar conditions obtain in the mountains of western Bantam.

The prominent volcano, G. Merapi (9,547 ft.) has had an important influence upon the distribution of population in the Magelang basin and in the native states of Jogjakarta and Soerakarta. Few parts of Java are more densely peopled or more intensively cultivated (Fig. 16). Despite the frequency of eruptions by this volcano (see vol. 1, p. 30 of this Handbook), causing destruction to life and property, a ring of crowded villages and farms spreads round its slopes; thus, the district of Moentilan to the west of Merapi has a population density of 2,500 per sq. mile, that of Melati, to the south, 3,300 per sq. mile and that of Kartosoero, to the east, 3,350 per sq. mile. The highest of the rural densities around Merapi is in the Klaten district south-east of the mountain where there are 3,800 per sq. mile, this district being the most important centre of tobacco cultivation in the native states. The towns of Jogjakarta (136,649), on one of the streams flowing southwards from Merapi, and Soerakarta (165,484), on the left bank of the upper Kali Solo, are the capitals of the native states which bear their name.

East of the north-south line of volcanoes marked by G. Oengaran, G. Telomojo, G. Merbaboe and G. Merapi, the interior of central Java is made up of two parallel ranges of Tertiary mountains, flanked by longitudinal depressions, while there are also a number of large volcanoes separated by transverse valleys. The Tertiary ranges are covered with teak forests and thinly peopled; the northerly one lies between the coastal plain and the Kali Loesi—lower Kali Solo depression, the southerly one between this depression and that followed by the upper Kali Solo and lower Kali Brantas (Fig. 17).

These depressions are well populated as are the transverse valleys in which lie the towns of Madioen (41,872), Kediri (48,567) and Malang (86,646). The slopes of the volcanic masses in this region are less densely peopled than those of G. Merapi and G. Slamet further west. Some of the largest coffee and rubber plantations in Java are found on the sides of G. Keloed and G. Boetak.

The southern coastal region of central Java is densely peopled between the mouth of the Kali Serajoe and that of the Kali Progo, but



Fig. 17. Settlements in the valley of the Kali Brantas

The Kali Brantas here flows south of a low range of Tertiary hills, which are forested and thinly peopled. There is a fringe of settlements along the foot of these hills. The broad and low river valley is densely peopled. Ploso lies about fifteen miles west of Modjokerto.

Source: *Java and Madura*, Sheet No. 53/XLI-A, G.S.G.S. 4202.

further east the population is thinly scattered. In the former section a density of 1,900 per sq. mile is reached in many districts of the coastal plain (Fig. 18). The villages are crowded together at the foot of the sand dunes which fringe the shoreline and along the base of the hills



Fig. 18. Settlements in the southern coastal plain of central Java

To the west and east of the central hills the settlements are strung out in almost parallel east-west lines, with rice fields in between, and separated from the sea by high sand dunes. In the central forested upland region, of which G. Doewoer (1,562 ft.) is the highest summit, the settlements are more scattered.

Source: *Java and Madura*, 1 : 50,000, sheet Nos. 44/XLII-B, 45/XLII-A, G.S.G.S. 4202.

at the inner edge of the plain. Irrigated rice cultivation is widely carried on. East of the Kali Progo valley the coastline and hinterland is rugged and inhospitable; the proportion of land under cultivation is small and the mean density of population is one of the lowest in the country.

Eastern Java

The narrow eastern part of Java from the meridian of Soerabaja to Bali strait has on the whole a relatively sparse population compared with the central and western parts of the island, though certain favoured areas record high densities. Probolinggo (37,009) and Pasoeroean (36,973) are the only large towns.

The most densely peopled area in eastern Java is that section of the northern coastal plain in the districts of Probolinggo (2,700 per sq. mile) and Pasoeroean (2,500 per sq. mile). Although the annual rainfall

is low, the many streams flowing into Madoera strait from the Tengger-gebergte provide ample water for irrigation. Rice and sugar are grown on a large scale. Where the streams reaching the plains are small and few in number, as in the Soemberwaroe district at the north-easternmost tip of the island, the soil cannot support a large population and in this particular district there are as few as 300 persons per sq. mile.



Fig. 19. Settlements near the mouth of the Kali Brantas

The K. Mas and K. Porong are the two main arms of the K. Brantas, the former entering Madoera strait at Soerabaja, the latter a short distance north-west of Pasoeroean. The settlements lie for the most part along the rivers and subsidiary watercourses. North of the K. Mas is a belt of settlements at the base of low hills adjoining the plain.

Source: *Java and Madura*, 1 : 50,000, sheet 54/XLI-A, G.S.G.S. 4202.

Three volcanic masses, the Tengger-gebergte, the Ijang-gebergte and the Idjen-gebergte, dominate this part of the island. As the proportion of their surface over 5,000 ft. is considerably higher than in the volcanoes of central and west Java they make far larger gaps in the population pattern. Between them are two broad saddles of volcanic debris, the more westerly of which has rather infertile, old volcanic soil and is thinly peopled, while the other, south of Bondowoso, is largely composed of recent volcanic ash producing a fertile soil which supports a relatively dense population.

The plains of the south coast are nowhere so densely peopled as those of the north. A number of districts with upwards of 1,500 per sq. mile are found in the broad lowlands near Djember, south of the Ijang-gebergte. This density does not reach to the coast, for large areas near the sea are low and swampy. A highly dissected group of sandstone mountains, with only a few scattered habitations, rises sharply to the east of the Djember plains and separates them from another lowland strip which lies between Gradjagan bay and Banjoewangi. This lowland has a mean density of under 750 per sq. mile; in the north-west, the gently inclined slopes of the Idjen-gebergte are covered with rubber and tea plantations. The extreme south-east of Java is formed by the Blambangan peninsula, a low limestone plateau, infertile and almost uninhabited.

Madoera

The island of Madoera has a population of 1,962,462 and a mean density of 1,375 per sq. mile. The central limestone range, broken in the west by a median depression, is a rather barren region with a relatively low density of population. On the other hand the encircling plains, particularly those in the west and south, are intensively cultivated and thickly settled. Rice, maize and tobacco are widely grown, and cattle rearing is important; many of the inhabitants also derive their subsistence from salt pans and fish ponds (see vol. 1, p. 195 of this Handbook). The chief towns are Bangkalan, Sampang, Pamekasan and Soemenep.

Distribution of Population in Sumatra

In 1930, Sumatra and its adjacent islands had a population of 8,254,843 and a mean density of 44 per sq. mile. Although this island is over three times the size of Java it has about one-fifth the number of inhabitants. The fertile volcanic ash soils, which have made possible

the exceptionally high densities in Java, are much less common in Sumatra, occurring only in the Lampoeng district of the south, in the mountains on the border of the Palembang and Benkoelen residencies, in the Padang Highlands and in the Batak country. Moreover, in many of these areas a higher proportion of acid than basic effusiva is ejected so that the population figures correspond more nearly to those of Java than to those for the rest of Sumatra. About 5% of the total population lives in towns, of which there are sixteen with populations of over 10,000. Palembang, Medan and Padang are the largest centres.

The great plains of eastern Sumatra, which are less than 35 miles broad in the extreme north and widen to over 125 miles in the centre and south, have some of the lowest densities in the whole island, though certain parts are fairly well peopled. Dense, tropical jungle, and marshlands overgrown with mangroves, cover extensive areas, particularly in the region adjoining Bangka strait and the southern section of Malacca strait. These areas are almost uninhabited. The main settlements in the plain are found on or near the banks of rivers at a level above the marshes. Thus, the small town of Menggala (14,174), in the Lampoeng district, lies in the centre of a fairly well settled region; even here the density of population is only about 60 per sq. mile. Further north is the valley of the large Air Moesi where the density in places exceeds 200 per sq. mile. The suitability of much of the land for irrigated rice cultivation, the recent establishment of rubber and coffee plantations and the presence of rich oilfields are among the factors which have drawn settlement to this region. Palembang (108,145), the largest town and chief commercial centre in the island, is situated on the Moesi where a low range of hills come close to the banks of the river. The neighbouring settlement of Pladjoe is the largest oil refining centre in the Netherlands Indies. Djambi (22,071), capital of the residency of that name, lies some distance north of Palembang on the banks of the Batang Hari. Between this town and the mouth of the Soengai Asahan, about 375 miles to the north, is one of the most thinly peopled regions in the whole island. In many places marshland extends to the foot of the western mountains. Even along the rivers the settlements are very scattered; in the valley of the S. Kampar-kiri there are 10 per sq. mile and in that of the S. Siak 3 per sq. mile.

North of the S. Asahan the eastern plains of Sumatra narrow considerably and the area under marsh is largely reduced to a strip along the coast. This section of the plain, known as the *cultuurgebied*, is one of the most densely populated parts of Sumatra, with densities

of over 200 per sq. mile. Tobacco, rubber, coffee, tea and the oil palm are widely cultivated, while mineral oil production is also important. The construction of roads and railways has helped to open up the region. Medan (76,584), on the S. Deli, is the second largest town in the island and the centre of the chief tobacco cultivating district. Tandjoengbalai (6,823), Tebingtinggi (14,026) and Bindjai (9,176) are other towns.

The mountains of western Sumatra, which run the entire length of the island from north-west to south-east, and which fall steeply to the narrow coastal plain bordering the Indian Ocean, are varied in relief and equally varied in their density of population. South of Padang few parts have more than 50 per sq. mile and Benkoelen (13,418) is the only important town; even in the vicinity of the active volcano of G. Kerintji the density is only 70 per sq. mile. With the opening up of this region during recent years by means of trunk roads, the population is likely to increase greatly. That this will be the case may be deduced from the fact that farther north in the Padang Highlands, under similar physical conditions, there is a greater concentration of population than in any other part of Sumatra. The fertile ash soils derived from the ejectamenta of G. Marapi and other volcanoes account for the concentration of settlement in this region. The district in which Fort de Kock (14,657) is situated has a population density of 900 per sq. mile, or, not counting the town, 850—the highest figure in the whole of Sumatra. In the Fort van der Capellen district, south-east of G. Marapi, the density is 650 per sq. mile, and in many other areas densities of over 400 per sq. mile are recorded. Along the intermontane depression south of this mountain are the towns of Padangpandjang (9,609) and Solok (6,214). Tobacco, coffee, coconuts and various forest products are grown in the Padang Highlands; coal is mined near Sawahloento. The densely settled region also extends to the coast where the rural districts of Pariaman and Padang have 500 and 530 per sq. mile respectively. Padang (52,054) is the chief town in western Sumatra and the third largest in the island; its port is at Emmahaven, 5 miles away, to which it is connected by road and railway.

The western mountain belt again becomes thinly peopled for some distance north of the Padang Highlands; most of the scattered settlements lie in the intermontane valley which continues as a marked feature of the landscape as far as the Batak plateau. This plateau, which is formed of comparatively recent volcanic tuff, is fairly well settled, a number of districts having over 200 per sq. mile. In the

centre of the region is the large lake Toba and the hills bounding this stretch of water on the east adjoin the economically important area between Medan and the S. Asahan on the east coast. Good roads connect the settlements on the shores of lake Toba with those in the neighbourhood of Medan. Roads also link the plateau with Sibolga (10,765), at the head of Tapanoei bay, on the west coast. In the mountains of Atjeh Residency, between the Batak plateau and the northernmost tip of Sumatra, the proportion of land suitable for cultivation is low and the population is very scanty. But on the narrow strip of coastal plain in the north much land is devoted to irrigated rice and to the cultivation of rubber and pepper. Here, many districts have more than 100 persons per sq. mile and one town, Koetaradja, has over 10,000 inhabitants. Marshes restrict the area of settlement in the western coastal plain, where Meulaboh (2,575) is the largest town.

A number of islands varying greatly in population density lie off the western and eastern coasts of Sumatra. Nias has the largest population of the western chain of islands, with 199,818 inhabitants in 1930 and a mean density of 143 per sq. mile. The other islands to the north and south, Simeuloeë, Batoe, Siberoet, Nassau and Enggano, have under 2 per sq. mile. Off the eastern coast of Sumatra are the islands of Bangka and Billiton and the archipelagoes of Riouw and Lingga, all of which are well populated. Bangka (205,363) and Billiton (73,429) owe their relatively large population to the important tin mining which has developed here. The three chief towns on Bangka, Tandjoengpandan (15,708), Pangkalpinang (11,970) and Muntok (6,929) are engaged in this industry. Tin mining has also attracted population to the Lingga archipelago, but in this as in the Riouw archipelago further north, and unlike Bangka and Billiton, many of the inhabitants are occupied in agriculture, particularly in the cultivation of gambir, a product mainly used for tanning. The port of Tandjoengpinang (5,789) is the capital of the Residency of Riouw en Onderhoorigheden; it lies on the eastern shores of Riouw strait, which forms the main channel of approach to Singapore from the south.

Distribution of Population in Borneo

At the time of the last census (1930) Dutch Borneo had a population of 2,168,661 and a mean density of 12 per sq. mile. Only the valleys of the west and south-east are at all well peopled and the mountainous

regions of the interior are for the most part uninhabited. Poor soil and dense impenetrable forest make much of the country inhospitable to settlement. The urban population forms about 10% of the total. Five towns, Bandjermasin, Pontianak, Balikpapan, Tarakan and Tandjoengseilor have over 10,000 inhabitants.

In the valleys of western Borneo a number of small districts near the coast have between 40 and 80 persons per sq. mile. One of the most favoured regions is the Sambas district in the extreme north-west, where much land is devoted to coconut and rubber plantations and to the cultivation of pepper. Singkawang (7,127), the chief town of this region, lies on the coast south of the mouth of the S. Sambas. Another fairly well cultivated though less densely peopled region is in the middle reaches of the S. Kapoeas, with its centre at Sintang (4,474). At the northernmost mouth of this river is the important town and port of Pontianak (45,196), which exports large quantities of rubber, copra and pepper. The only other town on the west coast is Ketapang (4,385), about 125 miles south of Pontianak.

The extensive marshy lowlands of southern Borneo as far east as the S. Barito, and the forested central regions, are practically uninhabited. The small settlements that do exist are all found along the banks of the rivers. In the section of the southern lowlands between the S. Barito and the north-east-south-west trending Meratoes-gebergte is a well populated region with densities of 200 per sq. mile in some areas. This relatively high density is made possible by the position of the region in the rain shadow of the Meratoes-gebergte, as a result of which the annual rainfall is less and the soil consequently made less infertile by continuous leaching. The fertility of the soil has caused large areas to be put under cultivation; rice and pepper are grown and there are also rubber and coconut plantations. The construction of several good roads has helped towards the opening up of this region. Kandangan (9,774), situated at the junction of the mountains and the plains, is an important market town, while Bandjermasin (65,698), near the mouth of S. Barito, is the chief outlet for the region and the largest town in the whole of Dutch Borneo.

The eastern coastal regions and mountains are everywhere thinly peopled, except for a few small districts near the coast where coal and oil have attracted settlement. Coal is mined on Poelau Laoet and exported from Kotabaroe (3,756) on the northern tip of the island. Further north, Balikpapan (29,843) is the centre of one of the largest oilfields in the Netherlands Indies (see p. 257). Another oilfield, on an

island at the mouth of the S. Sesajap in the extreme north, has given added importance to the town of Tarakan (11,589).

Distribution of Population in Celebes

The population of Celebes, which numbered 4,231,906 in 1930, is unevenly distributed. Large tracts of the mountainous interior are uninhabited and the bulk of the population lives in the south-western and northern peninsulas, where young volcanic soils permit an intensive cultivation. The mean density is 56 per sq. mile. Makassar, Gorontalo, Tondano and Manado are the chief towns.

In the south-western peninsula the volcanic ash soils, derived from the volcano G. Lompobatang, support a large population, the districts of Bonthain, Takalar and Pangkadjene having over 375 persons per sq. mile. Rice, maize, coffee and coconuts are the most important products. Makassar (84,855), on the west coast of the peninsula, is the main outlet for this region and the second largest town in the Outer Provinces (see p. 392). The belt of dense population extends northwards to the low-lying area near Singkang (5,847) and to the base of the peninsula in the Toradja country where volcanic soils again predominate. A network of good roads has contributed to the settlement of this peninsula.

The south-eastern and eastern peninsulas are sparsely peopled. The soils are nowhere so fertile as in the Makassar region and the proportion of cultivated land is low. In the narrow coastal plains, fishing, coconut cultivation and trading offer means of livelihood to a small number of people.

The easternmost end of the northern peninsula is one of the most densely peopled parts of Celebes. This is the Minahasa region which has extremely fertile, volcanic soils which are cultivated wherever relief permits; among the crops grown are rice, coconuts, coffee and spices. The population density averages between 200 and 400 per sq. mile. Manado (27,544), the second largest town in the island, is the chief port for the region and is connected by good roads with all the principal settlements of Minahasa. Another large town on the northern peninsula is Gorontalo (15,603), the main trading centre for the gulf of Tomini.

Distribution of Population in the Lesser Soenda islands

The Lesser Soenda islands, including Bali, Lombok, Soembawa, Soemba, Flores and Timor, had a population of 3,460,059 in 1930.

The following table gives the population figures for the main islands.

	Population	Density per sq. mile
Bali	1,101,393	750
Lombok	701,290	550
Soembawa	497,169	200
Soemba		
Flores	626,684	140
Dutch Timor	533,523	104
	<hr/> 3,460,059 <hr/>	<hr/> 180 <hr/>

Source: *Indisch Verslag*, 1938, vol. II, p. 15 (Batavia, 1938).

The two islands of Bali and Lombok have together over half the population of the Lesser Soenda islands. They owe their high density of population to the fertility of the volcanic ash soils and to the excellent facilities for irrigation. In both islands the most densely populated areas are the southern slopes of the volcanoes; in the Gianjar district of south Bali there are over 1,750 inhabitants per sq. mile—a density comparable to that in the fertile lowlands of Java—and many other districts have between 550 and 1,000 inhabitants per sq. mile. Rice, maize, tobacco, coconuts, coffee and tropical fruits are among the many crops grown. Denpasar (16,639) in the south of Bali, is the largest town of the island. The northern sides of the two islands, which suffer from drought for six months of the year, are far less densely peopled, with densities of about 350 per sq. mile. Singaradja (12,345), on the northern coastal plain of Bali, is the capital of the Residency of Bali and Lombok.

Soembawa, Soemba, Flores and Dutch Timor, the other larger islands of the Lesser Soenda group, are thinly peopled compared with Bali and Lombok. The greatest densities occur where recent volcanic soils permit an intensive agriculture, as in the eastern parts of Soembawa and Flores. The district of Maoemere in Flores has a density of 275 persons per sq. mile. By contrast, the barren soils of the Tertiary limestone areas of Soemba and Timor support under 40 per sq. mile. The largest towns in the group are Koepang (7,171) on Timor, and Raba (6,781) on Soembawa.

Distribution of Population in the Moluccas

The many large and small islands known collectively as the Moluccas have a total population of 579,129, according to the census of 1930. Most of the islands are mountainous and thickly forested and the population lives mainly on or near the coast. The highest densities are found where volcanic soils permit an intensive agriculture. Thus,

Ternate has a mean density of 580 per sq. mile, Tidore 500 per sq. mile, and Banda 275 per sq. mile. Rice, maize, sago, pepper, nutmegs and fruit are among the crops grown on the fertile soils of these islands. Few of the islands have important mineral resources; an oilfield around the shores of Boela bay in eastern Ceram has attracted a fairly large population.

Each of the main island groups of the Moluccas has at least one important trading centre, though Ternate and Amboina are the only large towns. Amboina (17,334), in a sheltered bay on Amboina island, is the chief commercial centre in this part of the Netherlands Indies. Ternate (7,126), on the south-east coast of the island of the same name, is the seat of an ancient sultanate.

Distribution of Population in Dutch New Guinea

Dutch New Guinea is one of the least populated and least known land areas of the world. In 1930 the population was estimated to total 314,271, which gives a mean density of about 2 per sq. mile. The high ranges of the central cordillera and large parts of the lowlands are completely uninhabited. A very low proportion of the land is under cultivation. The four main settlements, Merauke, Fakfak, Manokwari and Hollandia, all lie on the coast. Most of the native villages are found on the banks of rivers.

GROWTH OF POPULATION

In 1815, the population of Java was estimated at about four and a half million so that, even allowing for the probable inaccuracy of this figure, the population of the island has certainly multiplied several times during the past hundred years. The increase in population in the Outer Provinces over the same period is not known, though it is likely to have been less marked than in Java. Statistics showing the rates of growth are only available since 1905, the year of the first census. Other census returns were made in 1920 and 1930.* The following table shows the population in Java and Madoera and in the Outer Provinces at the time of each census.

Population Growth, 1905-30 (thousands)

	Java and Madoera	Outer Provinces	Total
1905	30,368	7,619	37,717
1920	34,978	14,366	49,350
1930	41,718	19,009	60,727

Source: *Indisch Verslag*, 1938, vol. II, pp. 32, 38, 41 (Batavia, 1938).

* Another census was due in 1940, but owing to the war it had to be postponed.

The official estimate of the population for 1940 is 70·5 millions, so that in recent years the population seems to have been growing at the rate of 1·5% per annum. Some of the most densely peopled regions of Java, such as the northern coastal plains from Cheribon to Semarang, and the valley of the lower Kali Brantas near Soerabaja, would seem to be approaching their saturation point for they show a relatively small growth of population (Fig. 20). Increase is most marked in those regions where plantation agriculture has recently been extended, as, for example, in the Preanger Residency south of Bandoeng, in the eastern part of the sultanate of Soerakarta, and in



Fig. 20. Increase of the native population in Java and Madoera, 1920-30

Source: *Indisch Verslag*, 1938, vol. II, p. 28 (Batavia, 1938).

the Banjoewangi district of Oost-Java. The great increase of population in the lowlands north of Cheribon may be attributed to the bringing under cultivation of a large part of the delta of the Tjiman-oek. The rapid growth of Batavia in recent years accounts for the high figure in the Batavia Residency.

Natural Increase

In Java the birth-rate is about 40 per thousand and the death-rate on the average 20 per thousand. The natural increase of the population is therefore about 20 per thousand. A higher death-rate is found in the towns than in the rural districts. In the Outer Provinces the birth-rate is not very different from that in Java, but the mortality rate is much higher, as the measure taken in Java for the improvement

of hygiene and the combating of disease have not yet been widely introduced elsewhere.

IMMIGRATION, EMIGRATION AND COLONIZATION

Immigration

Until within quite recent years few difficulties were placed in the way of persons wishing to visit or reside in the Netherlands Indies. Although certain conditions were imposed on intending residents, except government servants and consular officials, they were not ordinarily applied to tourists and others contemplating a merely temporary stay. Persons intending to stay for a long period were required to obtain an admission card, entitling them to remain for two years. This could be prolonged to six years by periodical renewals and those who wished could obtain a licence to reside more or less permanently. Immigrants were required to disembark at certain approved ports including the three chief ports in Java, namely, Tandjoengpriok, Semarang and Soerabaja, and twenty-one ports in the Outer Provinces, of which the chief were Belawan, Palembang, Pontianak and Makassar. Admission might be refused where the party concerned was of bad character, or considered dangerous to public order or safety. Labourers imported under contract were exempt from these conditions, but were subject to other rules framed with the same object of maintaining control over immigration without hindering it by unnecessary restrictions.

Of late years, however, there have been changes in the policy with reference to immigration. Restrictions have been imposed on the importation of contract labour (see p. 290) and on the number of Europeans (including Japanese) admitted. Formerly, the number of Japanese immigrants was so insignificant that separate figures for them were not published in the annual returns. But when the large increase of Japanese trade from 1931 onwards was followed by an influx of Japanese nationals it was thought expedient to enumerate them separately. This practice, introduced for the first time in 1933, showed that among those who received admission cards the number of Japanese exceeded that of all other 'Europeans' together. In addition to these, the number of Japanese visitors in 1934 exceeded 2,000. In view of the suspicions aroused by the number of Japanese and their activities, it was decided to limit the immigration of 'Europeans' to 800 annually and to assign to Japan a definite quota.

The figures for immigration during recent years are tabulated below.

Number of Immigrants, 1933-37

	Nether- landers	Japanese	Other 'Europeans'	Chinese	Other Foreign Orientals	Total
1933	2065	777	559	4594	925	9280
1934	2354	741	517	7542	745	11899
1935	2632	621	510	8054	903	12720
1936	3154	354	457	8046	727	12738
1937	3943	396	549	13333	1061	19282

Source: *Indisch Verslag*, 1938, vol. II, p. 45 (Batavia, 1938).

Emigration and Colonization

During the nineteenth century the abundant labour force was regarded as a main source of the wealth of Java and the export of Javanese labour was discouraged. On the abolition of slavery in Surinam in 1863 coolies were needed for the Dutch plantations there, but Liberals protested against the recruitment of coolies by the State and in 1887 secured the passing of a regulation to prohibit the recruitment of coolies for work abroad without the sanction of the government. Under this regulation a few thousand hands were supplied annually to Malaya, North Borneo, and Sarawak and in smaller numbers to New Caledonia and Cochin-China. About 1900 the development of the Outer Provinces was beginning to attract interest. In these there was a scarcity of labour and in Java a surplus. Measures were, therefore, taken to facilitate the recruitment in Java of labour for the Outer Provinces and also to relieve the surplus population of Java by settling colonies in the Outer Provinces.

The first experiment in colonization was made in 1905 when a few Javanese were settled at Gedongtataän in the Lampoeng Residency of southern Sumatra. This colony gradually took root and in 1909 and again in 1911 colonies on a smaller scale were formed in the Benkoelen Residency on the west coast of the island. But it was difficult to select suitable areas for colonization. The districts that offered the best prospects to colonists were for the most part already under development by capitalists, who wanted whole-time labour wholly dependent upon wages, rather than settlers who would work on the plantations in their spare time if the wages were sufficiently attractive. The task of colonization was difficult and costly and it seemed that, although beneficial to the comparatively small number of immigrants, very little impression could be made by that means on

the swarming population of Java. For these reasons, and also on account of the war of 1914-18, the interest in colonization languished, though further experiments, also on a small scale, were made between 1918 and 1922, mostly in the plantation area of Deli on the east coast of Sumatra. The settlements here, however, were in the nature of a labour reserve for the plantations rather than agricultural colonies. By 1929 there were some 45,000 settlers in the Oostkust Residency and about 30,000 in the Lampoeng and Benkoelen Residencies of Sumatra.

In 1930 and 1931 new colonies were started in Benkoelen for victims of the Merapi eruption, which rendered homeless several thousands of Javanese. By this time useful experience had been gained and, when vast numbers had been thrown out of work by the closing down of sugar factories and other enterprises during the depression of the early thirties, colonization was resumed on a considerable scale and new settlements were established not only in the areas already colonized, but also in the Palembang district and in parts of Borneo and Celebes. The operations were now entrusted to a special Agricultural and Colonization Bank of the civil service which devised a 'germinal system' (*systeem van kernvorming*) of colonization. In districts where much waste was available a few families were settled as the seed of future colonies; the families were subsidized by the State until they became self-supporting. This reduced the cost of colonization per head and enabled the government to undertake it on a much larger scale. Since 1937 there have been interesting experiments in the establishment of colonies, not of agriculturists but of foresters, in some of the waste spaces of the Outer Provinces: when the forests have been brought under control and any necessary clearings made there will be land available for cultivation either by the foresters or by new agricultural immigrants.

In 1937 a Central Commission for Emigration and Colonization was established and funds were provided out for the export duty on native rubber, the special Madoera Welfare Fund and the Dutch Welfare contribution of twenty-five million guilders. In the selection of colonists preference is generally given to young married couples. The government aims at a total emigration to the Outer Provinces of 150,000 a year; it is calculated that this figure will prevent a further increase in the overcrowded population of Java. In 1941 there were 117,000 colonists settled in the Lampoeng Residency, 14,500 in the Palembang Residency and 7,500 in the Benkoelen Residency of Sumatra; in the same year Celebes had

14,500 and Borneo 1,780 colonists. These figures only include emigrants who received State assistance, and they also exclude the labour colonies in the plantation region of north-eastern Sumatra.

European Colonization

During the world economic depression Europeans were in many ways hit more severely than the natives. Those who came from Europe could return home, but most of the Europeans in the Netherlands Indies are of local origin and partly of local blood, and to provide for these a number of colonization projects were devised. The Indo-European Union (*I.E. Verbond*) founded the Giesting-Colonization, the Indian Association for Individual Work-Provision founded colonies in Borneo, and there were other associations to encourage colonization on Poelau Laoet and in New Guinea. It soon appeared, however, that enthusiasm alone was not sufficient equipment for European colonization in the tropics, and in 1937 the government instituted a Colonization Council under the Department of Justice to enquire into the working of the movement and its result. The report of this council was on the whole unfavourable, but it pointed out that European colonization must in general depend on long period crops and that final judgment could not be pronounced in a shorter period than ten years. Very few colonists, however, had the capital to support themselves during the early years, when their land was making little or no return, and with the gradual return to prosperity from 1937 onwards European colonization ceased to be of importance.

RURAL SETTLEMENT

The settlement sites in the rural districts of the Netherlands Indies are as varied as they are interesting. Settlements are found on the banks of rivers, at the foot or on the lower slopes of volcanoes and close to sand-dunes near the coast. These are the most striking and characteristic of the village sites, but there are others, for numbers of villages have grown up along the main roads, or in close proximity to rubber, tea and coffee plantations which have been established by the Dutch in many parts since the beginning of the present century. In the following account of some of the chief settlement sites the examples are taken almost exclusively from Java, as this is the only large island of the Netherlands Indies with a complete series of large-scale maps.

River Bank Settlements

A large proportion of the settlements in Java lie on the banks of the main rivers and tributary streams. This site is favoured because



Fig. 21. Settlements near the mouth of the Tjitareom

Source: *Java and Madura*, 1 : 50,000, sheet Nos. 38/xxvi-C, 38/xxvii-A, G.S.G.S. 4202.



Plate 31. Berastagi, Sumatra

Berastagi is a hill-station, over 5,000 ft. above sea-level, about fifty miles south-south-west of Medan. There are a number of hotels, and many private bungalows owned by Europeans. In the background of the photograph is G. Sibajak (c. 7,000 ft.).



Plate 32. Native houses on the banks of the Soengai Belawan, Sumatra
In the broad low-lying plains of eastern Sumatra most of the settlements lie along river banks.



Plate 33. Native houses on tea plantation near Soemedang, Java
These houses have been specially built for the workers on the plantation.

the rivers at one time were, and to a large extent still are, the most important means of communication in many districts. Such a site also leaves the maximum area of land available for cultivation, a significant fact in an island where most of the inhabitants depend upon the growth of subsistence crops for their livelihood. In the northern plain of western Java an almost continuous line of villages runs along the banks of the Tjitareem, while the banks of the Kali Brantas in the east central part of the island are similarly teeming with people (Fig. 21). The lower courses of some of the rivers that flow into the Java Sea are embanked to prevent flood waters from



Fig. 22. Settlements on the slopes of G. Merapi

The fringe of settlements shown in this figure is typical of many of the volcanoes of Java (cf. Fig. 14).

Source: *Java and Madura*, 1 : 50,000, sheet No. 47/XLI-D, G.S.G.S. 4202.

inundating the surrounding plains; where there are embankments the villages have been built at their foot.

Volcano-fringing Settlements

The lower slopes of volcanoes form one of the most characteristic of the settlement sites in Java. Recent volcanic ash soils are able to support a dense agricultural population and wherever these are present the volcanoes are fringed by a girdle of settlement. This is particularly well seen on the slopes of the volcanoes, Goenoeng Tangkoebanprahoe, G. Slamet, G. Oengaran, and G. Merapi (Figs. 14, 22). The volcanoes of the Fort de Kock region in Sumatra, of the Makassar region in Celebes and of Bali and Lombok are also ringed by villages.

Sand-dune Settlements

In the southern coastal plain of Java from Tjilatjap to the mouth of the Kali Progo many settlements are found on the inner side of the sand-dunes which run in a series of lines parallel with the coast (Fig. 18). The dunes vary in height from 25 to 60 ft., and are from half a mile to one mile in width. The villages are long and narrow and frequently extend continuously for over three miles. The low-lying land between the dunes is devoted to rice cultivation.

Plantation Settlements

A certain number of settlements in the Netherlands Indies owe their location to the recent establishment of modern plantations. In countries such as Java, where the labour force can generally be recruited from villages in the neighbourhood, the special type of plantation settlement is not so common as in the far less densely peopled islands of Sumatra and Borneo. The chief rubber plantation region of Sumatra lies on the north-eastern coastal plain near Medan, and here villages have been specially built close to or in the centre of the plantations. Similar villages are seen in the plantation district north of Bandjermasin in Borneo.

TOWNS AND CITIES

In 1930 the Netherlands Indies had 118 towns with a population exceeding 10,000:

Over 100,000 inhabitants		
50,000—100,000	„	10
20,000— 50,000	„	36
10,000— 20,000	„	65
		<hr/>
		118
		<hr/>

Source: *Indisch Verslag*, 1938, vol. II, pp. 19–21 (Batavia, 1938).

Twenty-nine of these towns have a separate and autonomous municipal government and are classified in the census as 'municipalities'. All the larger towns, with the important exceptions of Soerakarta, Jogjakarta, Koedoes, Pontianak and Balikpapan, are included in this category.

The seven cities of over 100,000 inhabitants are as follows: Batavia, 533,015; Soerabaja, 341,675; Semarang, 217,796; Bandoeng, 166,815; Soerakarta, 165,484; Jogjakarta, 136,649; Palembang, 108,145. Six of the cities are thus in Java and only one in the Outer Provinces. Batavia is the capital of the Netherlands Indies and of

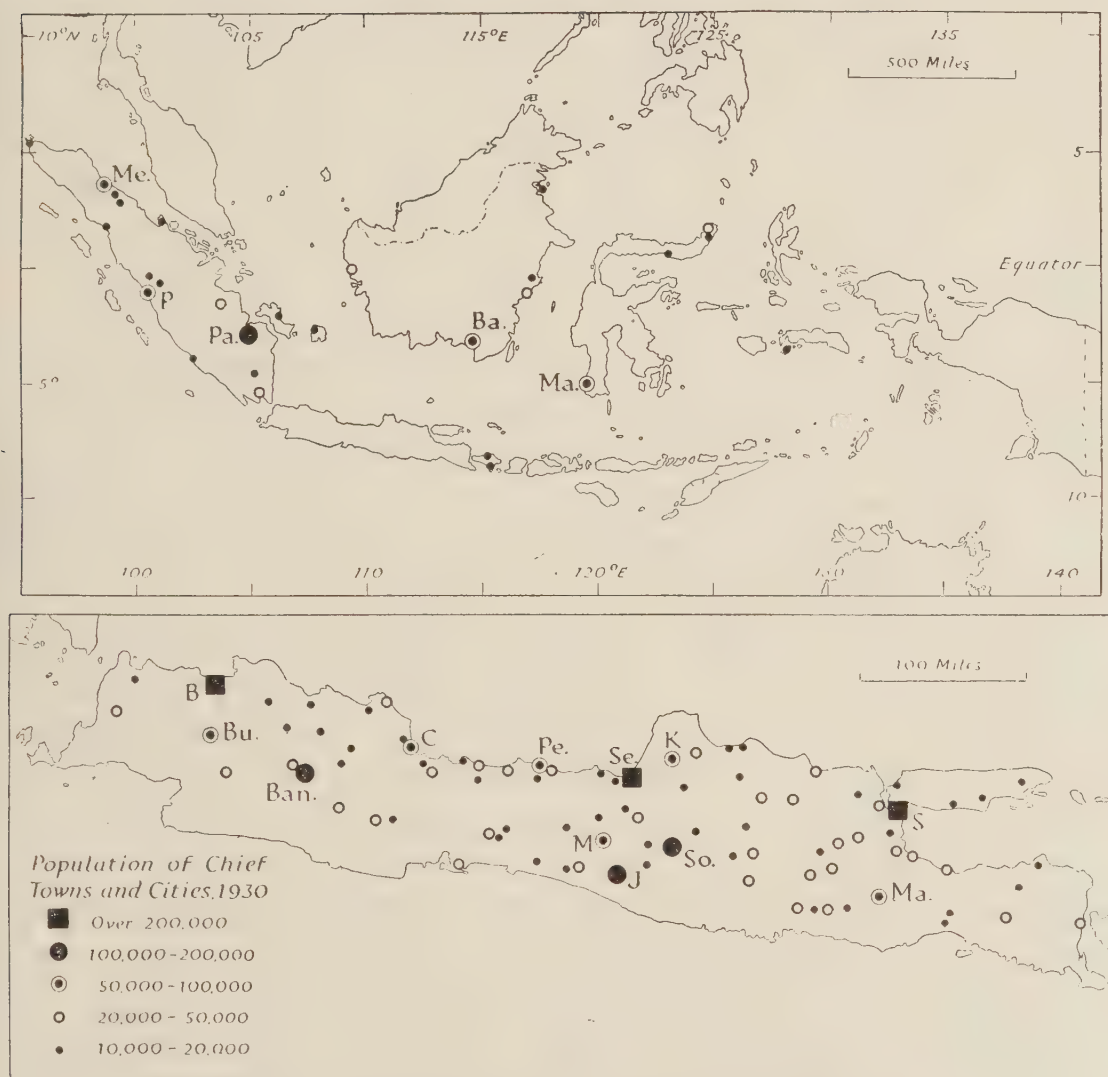


Fig. 23. Distribution of chief towns and cities

B Batavia	K Koedoes	Pa Palembang
Ba Bandjermasin	M Magelang	Pe Pekalongan
Ban Bandoeng	Ma (Java) Malang	S Soerabaja
Bu Buitenzorg	Ma (Celebes) Makassar	Se Semarang
C Cheribon	Me Medan	So Soerakarta
J Jogjakarta	P Padang	

Source: *Indisch Verslag*, 1938, vol. II, pp. 19-21 (Batavia, 1938).

the province of West-Java; Soerabaja and Semarang are two of the leading ports of Java. Bandoeng is an important centre in the uplands of western Java, while Soerakarta and Jogjakarta are the capitals of the native states which bear their name. Palembang is the leading industrial centre and port in Sumatra. Each of these towns has expanded rapidly in recent years.

Of the ten centres with a population of from 50,000 to 100,000, six are in Java, two in Sumatra, one in Borneo and one in Celebes. The Javanese towns of this size are Cheribon, Koedoes and Pekalongan in the densely peopled northern plains and Buitenzorg, Magelang and Malang in the central upland regions. Buitenzorg is the seat of the Governor-General. The towns in the Outer Provinces included in this group are Medan, the important market town for the plantation regions of north-east Sumatra; Padang, the main town on the west coast of Sumatra; Bandjermasin, the chief commercial centre in Borneo; and Makassar, the largest town in Celebes and the second largest town in the Netherlands Indies outside Java (Fig. 23).

Seventy-nine of the hundred and one towns with between 10,000 and 50,000 inhabitants are in Java. Most of these are market towns situated in the centre of densely peopled plains or upland basins. Of the twenty-two in the Outer Provinces within this group, twelve are in Sumatra, four in Borneo, three in Celebes, one in the Moluccas and two in Bali. Thirteen of these are ports and the rest are market towns.

The towns of the Netherlands Indies vary greatly in character and appearance. Many of the larger urban centres, such as Batavia and Bandoeng, are well laid out with finely constructed public buildings and luxurious gardens. The towns of Soerakarta and Jogjakarta have fortresses which bear witness to the struggles of the Dutch with the Javanese in former times; among the principal buildings are the palaces of the native sultans, who still hold nominal control over the states of Soerakarta and Jogjakarta. In contrast to these large towns, the smaller ones are frequently little more than enlarged villages, with narrow streets and few or no public buildings. A distinctive feature of a large proportion of the towns in Java and in the Outer Provinces is the division of the towns into separate quarters for the native, European, Chinese and Arab populations (Plates 67, 70, 75).

THE EUROPEAN POPULATION

Until the opening up of the East Indies to Western enterprise

shortly after the middle of last century there were relatively few Europeans, other than officials, living in any of the islands. Since 1870, when the new agrarian policy was adopted, the European population has steadily increased from 49,101 in this year to 91,142 in 1900, 168,114 in 1920 and 240,417 in 1930. The numbers of Europeans in each of the main islands and island groups in 1930 is shown in the table below.

	No. of Europeans	% of Total Population
Java and Madoera	192,571	0.46
Sumatra	28,496	0.35
Borneo	5,639	0.26
Lesser Soenda islands	1,528	0.45
Celebes	7,683	0.15
Moluccas	4,296	0.74
New Guinea	204	0.06
	<hr/> 240,417 <hr/>	<hr/> 0.40 <hr/>

Source: *Indisch Verslag*, 1938, vol. II, pp. 12-15 (Batavia, 1938).

About 80% of the Europeans live in Java and Madoera and of the number dwelling here over half reside in the four Regencies of Batavia, Bandoeng, Semarang and Soerabaja. A high proportion of the 47,846 Europeans living in the Outer Provinces are settled in a few localities: thus, 11,079 out of the 28,496 in Sumatra inhabit the Oostkust Residency, 3,529 out of the 4,562 in Borneo are in the Bandjermasin and Samarinda districts, whilst in Celebes and the Moluccas the majority of the Europeans are found in the three towns of Makassar, Manado and Amboina.

In 1930 the number of Europeans gainfully occupied was 85,321 or 35% of the total. The numbers employed in each of the major occupation groups are given in the table on p. 131. This table shows that 24% of the Europeans were engaged in official government positions and in the army, 22% in the production of raw materials, either as plantation owners or in mining concerns, while transport, commerce and the liberal professions each claimed about 13% of the total. The remaining 14% comprised those living on their incomes (9%) and those in industry (5%). Almost half of the Europeans in government service lived in the towns of West-Java, principally Batavia, Buitenzorg and Bandoeng. In the other parts of Java the occupations of the Europeans were more differentiated. In Sumatra, about 25% of the Europeans work on agricultural estates and in Borneo most of them are employed in the oil industry.

The nationality of the Europeans in the Netherlands Indies in 1930 is indicated in the following table.

Nationality	Java and Madoera	Outer Provinces	Total
Dutch	172,996	35,273	208,269
Germans and Austrians	4,774	2,607	7,381
Japanese	3,983	3,212	7,195
British	1,469	945	2,414
Swiss	301	489	790
Americans	289	354	643
Belgians	491	134	625
Armenians	467	75	542
Scandinavians	280	208	488
French	351	63	414
Filipinos	79	203	282
Russians	194	44	238
Italians	175	11	186
Poles	78	54	132
Turks	114	16	130
Czecho-Slovaks	94	27	121
Hungarians	72	38	110
Others	643	169	812
Native races	5,335	3,613	8,948
	192,571	47,591	240,162

Source: *Indisch Verslag*, 1938, vol. II, p. 16 (Batavia, 1938).

Both in Java and Madoera and in the Outer Provinces the Dutch are in the overwhelming majority. The only other large groups of European origin are those of German and of British nationality. The term 'Europeans' includes not only whites, but also all those holding the legal status of a European; this explains the inclusion in the table of a number of Japanese, Filipinos, Turks and various groups of natives. Eurasians, commonly known in the Indies as Indo-Europeans or Indos, form a high proportion of the total European population, though no accurate statistics are available.

The European population is composed partly of permanent and partly of temporary residents. In the early days of European settlement in the Netherlands Indies immigration was almost always of a temporary nature, but, though this is still true for most of the European community, the proportion of permanent residents has recently grown enormously. This may be ascribed to an increase in the number of births* and to the fact that many of the children born

*As the vital statistics given in the census returns relate to the entire European population and do not discriminate between the Asiatics and the Europeans proper they cannot be said to give a true picture of the demographic conditions. According to the statistics available the birth-rate fluctuates between 23 and 27 per thousand and the death rate between 15 and 20 per thousand.

here have, after a short sojourn abroad, elected to make their home in the Netherlands Indies. The increase in the number of births has arisen as a result of the large percentage of young married persons among the Europeans. The sex-ratio is fairly evenly balanced, though this has been a relatively recent development, for in 1880

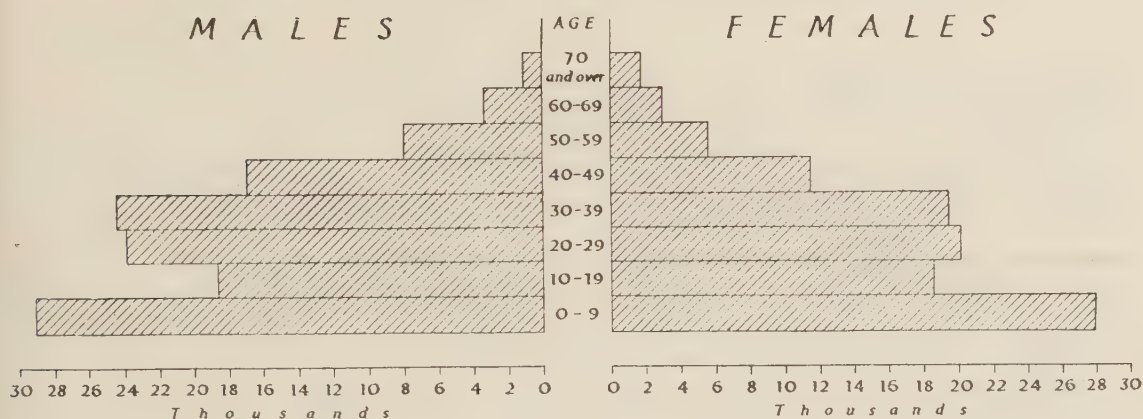


Fig. 24. Age-groups of the European population

Source: *Indisch Verslag*, 1938, vol. II, p. 30 (Batavia, 1938).

there were less than 500 women per 1,000 men. Since 1900 the number of women has increased at a far more rapid rate than the number of men, so that in 1930 the sex ratio was 884 women to 1,000 men. This ratio does not vary greatly from one age-group to another, except in the group of those over 70 years, when the number of women exceeds that of the men, an anomaly which is probably due to the return of bachelors to the Netherlands on retirement (Fig. 24).

THE CHINESE POPULATION

The settlement of Chinese in the East Indies dates back many hundreds of years. They were important and influential long before the entry of the Europeans and they remain to this day the largest non-native group. Their numbers have increased from 221,438 in 1860 to 1,233,214 in 1930, almost a sixfold increase in seventy years. Most of the Chinese come from the provinces of Fukien and Kwangtung in southern China. Fig. 25 shows the distribution and the table below the numbers of the Chinese in the Netherlands Indies in 1930.

	No. of Chinese	% of Total Population
Java and Madoera	582,431	1.4
Sumatra	448,552	5.4
Borneo	134,287	6.2
Celebes	41,402	0.9
Lesser Soenda islands	17,816	0.5
Moluccas	7,454	1.3
New Guinea	1,272	0.4
	<hr/> 1,233,214 <hr/>	<hr/> 2.0 <hr/>

Source: *Indisch Verslag*, 1938, vol. II, pp. 12-15 (Batavia, 1938).

The Chinese are far more widely dispersed than the Europeans, but large concentrations are found in all the principal towns; thus,



Fig. 25. Distribution of the Chinese population

B Batavia	J Jogjakarta	Po Pontianak
Ba Bagansiapiapi	M Malang	S Soerabaja
Bn Bandoeng	Ma Makassar	Se Semarang
Bu Buitenzorg	Me Medan	So Soerakarta
C Cheribon	P Palembang	T Tandjoengpandan

Source: Folding map at end of *Volkstelling*, 1930, *Deel VII. Chineezen en Andere Vreemde Oostelingen in Nederlandsch-Indië* (Batavia, 1935).

one-third of the Chinese in Java live in the three Regencies of Batavia, Semarang and Soerabaja. A striking feature of their distribution is the high proportion in the Outer Provinces. Many thousands have been drawn to the tin mines of Bangka and Billiton and to the European plantations in north-eastern Sumatra. Over 300,000 of the Chinese in Sumatra are in these regions. In Borneo, 75% dwell in the two districts of Singkawang and Pontianak on the west coast.

In 1930 the number of Chinese gainfully occupied amounted to 469,935 (see table on p. 131). Over one-third were engaged in commerce, especially as petty traders and shopkeepers. Another third gained their livelihood from agricultural activities, market gardening, fishing and mining. Industry, which accounted for a fifth of the total, was the only other large occupational group; woodworking and the preparation of foodstuffs were the main industrial activities.

Considerable intermixture has taken place between the Chinese and the native peoples, since until recently relatively few women accompanied the Chinese immigrants. Even to-day the sex ratio is unbalanced, the number of males exceeding that of the females by

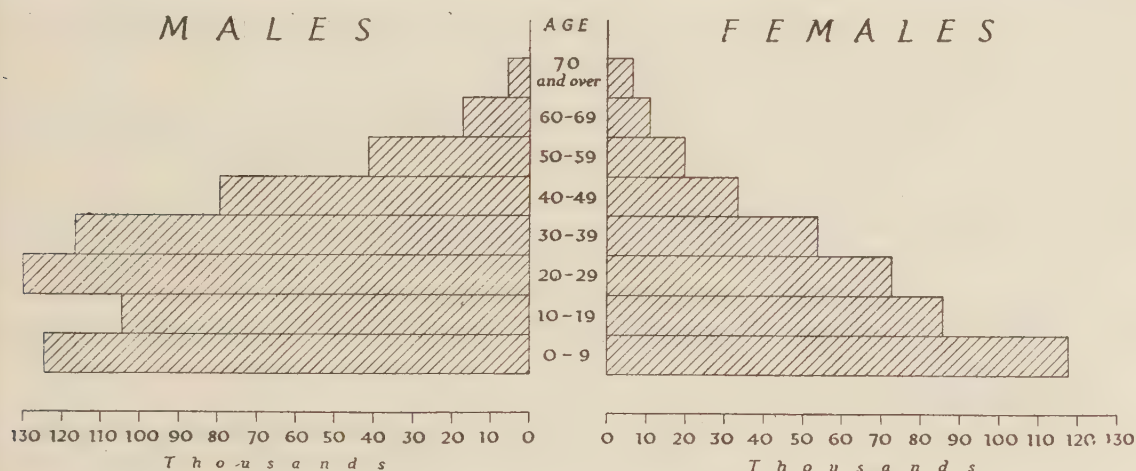


Fig. 26. Age-groups of the Chinese population

Source: *Indisch Verslag*, 1938, vol. II, p. 40 (Batavia, 1938).

over 250,000. About one-third of the Chinese are between the ages of 20 and 40 and in this age-group there are 325,209 males to 159,651 females or a ratio of two to one. The high proportion of this age and the lowness of the marriage rate—about 40% of the Chinese over the age of fifteen are celibate—is due to the large number who emigrate from China to the Netherlands Indies, remain a few years and then return home. Few stay in the Indies after they have reached the age of fifty (Fig. 26).

THE ARAB POPULATION

Among the non-indigenous population groups of the Netherlands Indies the Arabs come next to the Chinese and Europeans in order of size and importance. They numbered 71,335 in 1930, most of whom originate from the Hadhramaut region of south-central Arabia. Although nearly 60% of the Arabs live in Java and Madoera they are found scattered widely in most of the islands. They are mainly occupied in the retail trade or as commercial middlemen.

The Arabs, like the Chinese, have to a large extent mixed with the native peoples, without losing their distinctive position in society. Unlike the Chinese, however, they almost always settle permanently in the country. They are highly respected by the native peoples.

BIBLIOGRAPHICAL NOTE

1. The census returns for 1930 are published by the *Departement van Landbouw, Nijverheid en Handel*. The preliminary results appeared in 1931 and the full census has been published at intervals since then. A summarized statement of the census is given in the *Indisch Verslag* of recent years.

2. The following articles will be found useful for a study of the distribution and density of population:

J. van Gelderen, 'Western enterprises and the density of the population in the Netherlands Indies' *The Effect of Western Influence on Native Civilizations in the Malay Archipelago*, pp. 85-102 (Batavia, 1929).

G. Kuperus, 'The relation between density of population and utilization of soil in Java' *Comptes Rendues du Congrès International de Géographie, Amsterdam, 1938*, II. pp. 465-77 (Leiden, 1938).

E. C. J. Mohr, 'The relation between soil and population density in the Netherlands East Indies' *Comptes Rendues du Congrès International de Géographie, Amsterdam, 1938*, II. pp. 478-93 (Leiden, 1938).

M. B. Smits, 'Population density and soil utilization in the Netherlands Indies' *Comptes Rendues du Congrès International de Géographie, Amsterdam, 1938*, II. pp. 500-06 (Leiden, 1938).

3. There is a short account of the European, Chinese and Arab populations in J. S. Furnivall, *Netherlands India* (Cambridge, 1939) and in Amry Vandenbosch, *The Dutch East Indies* (Berkeley, 1942). See also C. L. van Doorn, 'The European Population of the Dutch East Indies' *Asiatic Review*, vol. xxvi, pp. 509-16 (London, 1930), and Leonard Unger, 'The Chinese in South-east Asia' *Geographical Review*, vol. xxxiv, pp. 196-217 (New York, 1944).

Chapter VI

AGRICULTURE

General Features: Irrigation: Chief Crops: Livestock: Horticulture:
Distribution of Crops and Livestock: Agricultural Policy:
Land Tenure: Fisheries: Bibliographical Note

GENERAL FEATURES

The Netherlands Indies have long held a unique place among tropical countries because of the quantity, variety and excellence of their agricultural products. In the sixteenth century, when they first began to play a part in European history, the East Indies became famous as the source of the much-coveted spices. In modern times the spice trade has become of very minor importance, but for many tropical products, such as cane sugar, the Netherlands Indies have captured a share of the world market quite out of proportion to their size and for others, such as quinine, they have had a virtual monopoly. In few other tropical countries have agricultural exports played such an important part in the national economy. In 1939 about 10 million acres out of a total cultivated area of some 40 million acres were planted with crops for export, and agricultural products accounted for 65 to 70% of the total value of exports and earned more than a third of the national income. Besides producing such a great volume of exports, the agriculture of the Netherlands Indies provides the greater part of the rice and other food required to feed the population of the islands.

For this pre-eminence in tropical agriculture there are several reasons. The East Indies, especially Java, have been generously endowed by nature. The soil, chiefly owing to the rejuvenating effects of volcanic eruptions (see chap. i of vol. I of this Handbook), is much more fertile than that of many other tropical countries and the climate suits a great number of different crop plants; even where rainfall is deficient the drainage from the mountains gives a plentiful supply of water for irrigation. More important, probably, than any of these factors are the organizing ability of the Dutch, the intelligence and energy with which they have developed scientific research and applied its results to practical affairs, and the presence of an

industrious native population schooled by a long tradition in the practice of agriculture.

In agriculture, as in almost everything else, there is a sharp contrast between conditions in Java and Madoera and those in the rest of the Indies (the Outer Provinces or *Buitengewesten*). In densely populated Java almost all suitable land is used for agriculture, much of it intensive and on more or less scientific lines; over three-fifths of the whole island is cultivated. The table (p. 172), shows that 60% (by weight) of all the agricultural produce exported from the Netherlands Indies in 1937 came from Java and Madoera. On the other hand, in the sparsely populated Outer Provinces there are vast areas of primitive forest and waste land and, except in parts of Sumatra and in Bali, agricultural land occupies only a small fraction of the total area. The predominant agricultural system in the Outer Provinces is *ladang* or shifting cultivation; patches of forest are cleared and crops are grown on them for one or two seasons; afterwards the land is abandoned and forest allowed to grow up again. It is thus very difficult to generalize about agriculture in the Netherlands Indies; at one extreme, there is highly scientific, intensive agriculture producing crops mainly for export, at the other, primitive subsistence agriculture carried on by the natives in exactly the same way now as for centuries past.

PLANTATION AGRICULTURE AND NATIVE AGRICULTURE

Agriculture in the Netherlands Indies is partly in European, partly in native hands. European agriculture is carried on in large plantations, the land mostly being held on long lease from the government or from native rulers. The crops are mostly intended for export and the methods of cultivation are modern and scientific. Native agriculture is on a much smaller scale and carried on by more primitive methods. Though the natives practise agriculture mainly for subsistence, they also produce a considerable and increasing share of the exports—about 40% in 1938. By education, and by irrigation and other means, the government has done much to help the native cultivator to increase the yield of his land and raise the quality of his crops, even where, as in Java and Bali, agriculture was already highly developed before Dutch rule was introduced.

Though some crops are grown mainly on European plantations, others mainly on land farmed by natives, there are very few crops which are exclusively European or exclusively native. The chief food

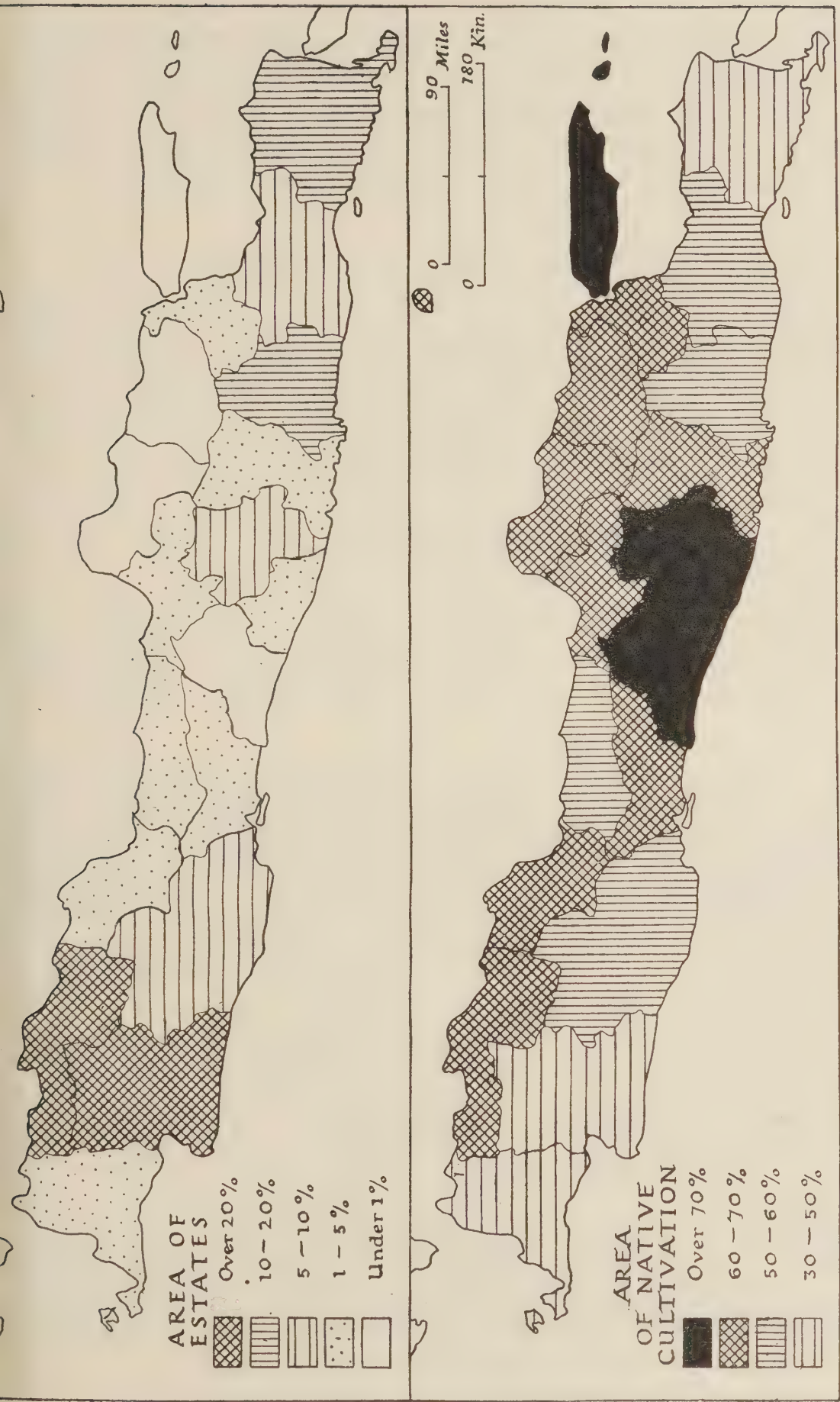


Fig. 27. Java and Madoera. Percentage of area under native cultivation and under estates
Source: *Indisch Verslag*, 1938, vol. II, pp. 240, 243 (Batavia, 1938).

crops, especially rice, which is by far the most important single crop in the Netherlands Indies, are cultivated almost entirely by the natives. Sugar, tea, cinchona and palm oil on the other hand are mainly plantation crops. Some export crops, such as pepper, are mainly native grown. Coconuts and cassava (tapioca) are grown by Europeans and natives equally. The better grades of tobacco are grown on

Exports of agricultural products, Netherlands Indies, (1937)

Exports are classified according to their place of origin, irrespective of the port of shipment. Native products processed on estates are reckoned as native. The estate share of sugar exports is estimated. All weights are net, except potatoes, gambir, cinnamon, soya beans, cloves, nutmegs, broken rice and tapioca refuse.

Product	Weight (metric tons)					Value (f 1,000)
	Estate		Native		Total	
	Java and Madoera	Outer Provinces	Java and Madoera	Outer Provinces		
Agave and other other fibres	31,803	56,950	114	1	88,968	15,269
Betel nut	—	—	6,797	49,593	56,390	5,704
Cinchona products	5,751	802	—	—	6,553	10,300
Cinnamon	—	—	84	2,289	2,373	642
Cloves	—	—	—	542	542	302
Coca leaf	133	—	—	—	133	63
Cocoa	1,306	5	—	29	1,340	659
Coconut products	4,289	27,776	102,983	470,894	605,942	72,113
Coffee	22,033	8,368	—	67,998	98,399	25,868
Gambir	—	3,335	—	2,786	6,121	1,226
Essential oils	250	539	1,101	203	2,099	2,858
Gutta percha	143	—	—	—	—	351
Kapok products	7,122	68	47,060	5,359	59,609	8,899
Maize	—	—	138,230	76,641	214,871	6,766
Nutmeg products	162	897	—	4,065	5,124	2,073
Palm oil products	10	238,356	—	—	238,366	29,051
Pepper	95	70	—	31,118	31,283	6,993
Potatoes	—	—	249	818	1,067	69
Rice products	—	—	57,747	18,903	76,650	3,431
Rubber products	85,574	144,605	—	208,550	438,729	296,772
Soya beans	—	—	11,158	504	11,662	550
Sugar and molasses	1,342,002	—	8,861	1	1,350,864	51,108
Tapioca products	90,144	—	351,124	5	441,273	18,383
Tea	38,988	15,558	12,170	—	66,716	49,061
Tobacco products	22,118	11,887	14,777	264	49,046	41,070
TOTAL, including all other agricultural products	1,652,148	509,577	809,375	1,007,740	3,978,840	660,053
Total, 1935					3,275,297	294,527
Total, 1928					5,139,770	1,237,066

Source: *Indisch Verslag*, 1938, vol. II, pp. 274-5 (Batavia, 1938).

European estates, the lower grades by natives. The increase in the native contribution to rubber production is one of the most significant changes in the agriculture of the last twenty years. Rubber planting in the Netherlands Indies began about 1900 and for about twenty years was almost entirely in European hands. When the success of the European plantations had become apparent and it had become clear that neither a great deal of effort nor a high degree of technical skill was necessary for good returns, the natives began to plant rubber on a large scale, particularly in the Djambi and Palembang districts of Sumatra and in Borneo. The export of native-grown rubber rose from about 13,000 tons in 1919 to 92,712 tons in 1938. When prices are low the natives abandon their plantations and resume production when the market improves. Since, for obvious reasons, European planters cannot do this, it is not unlikely that the rubber industry will eventually pass entirely into native hands.

METHODS OF CULTIVATION

A distinction has already been drawn between the permanent and the shifting systems of cultivation, the former practised in Java and other economically well developed parts of the Netherlands Indies, the



Fig. 28. Ploughing with oxen, Narmada, Lombok

Drawn from a photograph.

latter in the more backward areas of the Outer Provinces. A further distinction must be noted between the two main types of permanent agriculture, the 'wet' or embanked system and the 'dry' or unembanked system. In 'wet' cultivation the land is periodically flooded by artificial irrigation or from natural sources of water such as streams and rainfall. The chief crops grown by the 'wet' method are rice, sugar, soya beans and cotton. Most other crops are generally grown on 'dry' land.

The implements used in cultivation vary from the most up-to-date machinery on European plantations to the simplest possible native tools. In Java the rice fields are ploughed with oxen in the east and buffaloes in the west. The plough used for irrigated land is of teak with a yoke of bamboo, the point being tipped with iron. For dry and mountain cultivation a simpler and lighter plough is used. The small Chinese plough, drawn by one buffalo, is used for gardens and small fields. Besides a plough the chief items in the equipment of the Javanese peasant are a harrow, the *patjoel* or hoe, a small hatchet or weeding knife called the *arit*, the *ani-ani*, a knife used for reaping the rice ears, and sometimes a roller and a dibble.

SOIL EROSION

In recent years it has come to be realized that no system of cultivation is satisfactory which does not eliminate or at least reduce the danger of soil erosion (see chap. XI of vol. I of this Handbook and p. 240). In the Netherlands Indies erosion has not yet become a major problem, as it has in so many other countries, but the danger cannot be neglected. The various methods of cultivation practised by natives and Europeans expose the soil to the risk of erosion to very different degrees. In *sawah* cultivation erosion is almost entirely eliminated, which is one of the chief reasons for the sustained productivity of native Javanese agriculture. On the other hand, native dry fields or *tegallan* in permanent cultivation, especially when situated on steep slopes, rapidly lose their fertility owing to the washing away of the surface soil. The primitive *ladang* system, however, whatever may be its other disadvantages, does not lead to erosion unless followed by frequent burning, as in the damp climate of the Netherlands Indies the abandoned fields become so rapidly overgrown with weeds that the soil is soon adequately protected. The agricultural authorities have for some time been increasingly aware that the first duty of the cultivator is to maintain the fertility of the

soil by protecting it against erosion. It is now realized that meticulous weeding and hoeing does more harm than good, as it loosens the soil and allows it to be more easily washed away. On plantations, particularly in the mountains, various anti-erosion measures are becoming common practice, such as terracing, contour ploughing, digging of catchment ditches (*rorak*) and holes and the planting of contour strips with evergreen shrubs and green manures. On the tea plantations it is now the custom to spread the prunings on the ground between the bushes; this has the advantage of increasing the humus content of the soil, as well as protecting it against erosion. It is claimed by some that where adequate measures are taken, the danger of erosion need be no greater on a well managed plantation than under a natural forest cover. The introduction of anti-erosion measures in native cultivation is a more difficult problem. The only solution is gradually to educate the native cultivator to the importance of erosion and to make him aware of the advantages of taking sufficient care of the soil. Some measures needed to control erosion, such as afforestation (p. 244) and flood control, are problems for the forester and the engineer rather than the agriculturalist.

IRRIGATION

Irrigation is necessary over large parts of the East Indies, partly because in many places, as in east Java, there is a long period during the east monsoon when there is very little rain, partly because the principal native food crop, rice, though it can be grown in unirrigated fields (called *tegal* in Java), is more profitably grown in fields (called *sawah*), flooded to a depth of a few inches during the greater part of the



Fig. 29. Area of *sawah*, Java and Madoera

Source: *Atlas van Tropisch Nederland*, plate 17 (Batavia, 1938).

growing seasons. In the hill country of Java the flooded *sawah* are arranged in terraces up the hillsides and form a charming and characteristic element in the scenery. Sugar and various other major crops require, or do best, under irrigation. Irrigation has the advantage that a supply of mineral plant food is carried in solution in the water supply (Fig. 29).

The quantity of water needed for rice cultivation is considerable, but varies with the porosity of the soil and the stage of growth of the crop. The average requirement is about 3.6–5.4 galls. per acre per minute on clay soil and up to more than twice this amount on more porous loamy or sandy soils. During the west monsoon the rice crop receives the whole of the irrigation water, but in the east monsoon part of the supply is diverted to other crops. Since in all the larger East Indian islands there are mountains receiving an abundant rainfall at all times of the year, the necessary water is not far to seek. All that is needed is to canalize it, take it where it is wanted and make arrangements for regulating the flow at different times of year.

In Java the greater part of the cultivated land, except in the high mountains, is irrigated. Elsewhere, irrigation on a large scale is found only in Bali and parts of Sumatra and Celebes.

NATIVE IRRIGATION SYSTEMS

The natives of Java and Bali have practised irrigation since long before the coming of the Dutch, probably indeed since before the Indian invasion. The native methods can be seen at their highest development at the present day in Bali. Here the *sawah* are supplied from reservoirs or *wadoek*, by means of aqueducts and channels constructed with extraordinary ingenuity. In each district the control of the water supplies is in the hands of a remarkable native institution, a kind of co-operative society called a *soebak*, which in addition to dealing with irrigation settles questions of land ownership and other agricultural matters. In Java a large part of the cultivated land is still supplied with water by native irrigation systems, which as in Bali are skilfully constructed, but since at best these native systems have many disadvantages, they are being gradually supplanted by modern large-scale irrigation works. In the Westkust Residency of Sumatra the Menangkabau have developed a system of irrigation, peculiar to themselves, making use of water wheels.

The commonest type of native irrigation system in Java begins with the construction of a weir in a river, made of stones and brushwood or bamboo, twigs, leaves and soil being added to make it hold water. Channels are then built which take off the water and lead it through a system of distributaries to the *sawah*, to which it is admitted either through cuts in the dykes or through bamboo pipes. The water runs slowly over the fields and from one terrace to the next till it is eventually led away in drainage channels.

MODERN IRRIGATION WORKS

Though the native irrigation systems show great ingenuity in using the simple materials available, they are inefficient in several ways. During the wet season floods often damage the weirs or wash them away entirely. It is difficult to regulate the supply of water properly and the stream often makes for itself a new course round the weir so that the irrigation system is left dry. At other times the stream may become diverted so that the irrigation inlet becomes its main channel. For these reasons the government has spent much money and energy in constructing irrigation systems built on modern engineering principles. A number of these waterworks in Java, for instance that at Demak in the Residency of Semarang, date back to the time of the Culture System (see p. 84) in the early nineteenth century, but progress did not really begin till 1885 when the Irrigation Brigade was set up as a special section of the Corps of Engineers. The first Irrigation Division (*Irrigatie Afdeeling*) was created in 1889 to deal

District	River	Irrigated area (acres)
Bantam	Tjioedjoeng	76,600
Krawang	Tjitaroem	192,700
Indramajoe	Tjimanoek	244,600
Tegal	Pemali	76,600
Tegal	Goeng	45,200
Koedoes (Demak water-works)	Toentang and Serang	81,500
Madioen	Madioen	35,800
Soerabaja (Sidoardjo delta)	Brantas	84,000
Kediri (Waroedjajeng and Kertosono districts)	Brantas	35,800
Djember	Bedadoeng	44,500
Djember	Majong	28,400
Djember	Bondojoedo and Tanggoel	59,300
Bondowoso	Sampean	44,500

Source: *Handbook of the Netherlands East Indies*, p. 209 (Batavia, 1930).

with the Serajoe, the chief river of the south coast. This undertaking was so successful that a general irrigation scheme was introduced and by 1912 there were seven Irrigation Divisions in full working order. In 1937 2,736,800 acres were irrigated by modern systems. The table on page 177 shows the areas supplied from some of the chief rivers (Plate 34).

The areas irrigated by these modern works are divided into compartments of about 250 acres. A weir and one or more head sluices (with sliding gates for regulating the water intake) are built in the river. One or two scouring sluices are also constructed at right angles to the head sluices to prevent coarse material being carried into the irrigation canal. From the main canal the water runs through branches into the fields, the intake of each branch being regulated by gates. Where the irrigation canals have to cross roads or rivers, aqueducts, culverts, or inverted syphons are built. The main Pemali canal flows through one of the largest aqueducts in the world and the drainage water from the Watoedakon irrigation area (about 32,000 acres) is carried under the Brantas river in a reinforced concrete inverted syphon with a maximum capacity of 212 cu. ft. per sec.

The construction and maintenance of the irrigation works and the equitable distribution of the water gives rise to intricate problems of administration. The central government provides for the construction of new works, but since 1918 maintenance has been gradually made over to Irrigation Boards (*Waterschappen*), which are now controlled by the provincial governments. The supply of water to European plantations is managed by the Irrigation Service, but the distribution of water among the native cultivators is left to the villages concerned.

Contrary to the practice in British India, water is supplied free to the native cultivators; there is no water rate and no increase in the land tax because water is supplied by the State. Planters, however, contribute towards the cost of supplying water to their estates.

CHIEF CROPS

The following table shows the production of the chief crops on European (including government) plantations, together with the areas occupied by each. Cantala, hemp, sisal and other fibres are not included as returns for them are no longer published.



Plate 34. Irrigation sluice on the Kali Serajoe near Banjoemas



Plate 35. Harrowing in flooded rice field, Bali



Plate 36. Rice fields, Bali



Plate 37. Terraced rice fields, near Pematangsiantar, Sumatra

*Production and area of the chief plantation crops,
Netherlands Indies (1937)*

Crop	Java and Madoera		Outer Provinces		Total Production (1,000 m. tons)
	Number of estates	Area planted (1,000 acres)	Number of estates	Area planted (1,000 acres)	
Cinchona (quinine)	99	38.0	9	4.4	10.4
Coca (cocaine)	50	1.7	2	—	0.1
Cacao (cocoa)	29	15.0	8	2.5	1.7
Coffee	325	229.8	—	—	62.4
Copra	141	17.0	524	104.2	32.7
Gambir (cutch)	—	—	12	3.7	3.3
Essential oils	90	16.5	4	—	0.5
Ficus (rubber)	48	5.9	17	3.0	—
Gutta percha	1	2.7	2	0.5	0.1
Kapok	174	57.5	39	3.5	—
Nutmeg	15	4.2	17	2.7	—
Palm oil	5	1.9	58	203.8	—
Pepper	34	5.9	12	0.5	—
Rubber	604	562.1	593	905.4	245.0*
Sugar	37	88.0	—	—	574.7*
Tea	297	259.0	38	84.5	74.5*
Tobacco	36	72.7	47	32.1	47.5

* Including purchases from natives.

Source: *Indisch Verslag*, 1938, vol. II, pp. 266–8 (Batavia, 1938).

The following figures for the chief native crops give the areas only. No data are available for native crops in the Outer Provinces.

Area of the chief native crops, Java and Madoera (1937)

Only annual crops are included. Twice-cropped areas are reckoned twice.

Thousands of acres

Cereals:	
Rice, wet	8,591
Rice, dry	966
Maize	5,112
Root crops:	
Cassava (tapioca)	2,347
Yams	447
Potatoes	25
Other roots	274
Pulses:	
Peanuts	581
Soya beans	872
Other pulses	519
Other crops:	
Tobacco	371
Miscellaneous	1,374
Total area	21,479,000 acres

Source: *Indisch Verslag*, 1938, vol. II, pp. 260–1 (Batavia, 1938).

RICE

Rice is the chief subsistence food crop of the Netherlands Indies. In Java it has been cultivated for many centuries and it is generally held that the name Java (*Jawa-dwipa*) means 'rice island'; *sawah* or 'wet' rice cultivation is so nearly synonymous with agriculture that in the Javanese and Soendanesse languages the same word, *tani*, is used for both.



Fig. 30. Proportion of vegetables, other than rice, in native diet

The proportion of other vegetables is calculated on the basis of the amount of rice eaten, each year being 100. The sudden rise in 1920 was due to the partial failure of the rice crop. The tendency towards a more mixed diet is clearly shown. Source: M. B. Smits, 'Rice imports of the Netherlands Indies' *Proceedings of the 4th Pacific Science Congress, Batavia-Bandoeng*, 1929, vol. IV, pp. 236-7 (Batavia-Bandoeng, 1930).

Except in a few small regions, rice is the staple food of the natives throughout the Netherlands Indies and in Java and Madoera alone over three and a half million tons of rice are grown annually. Though rice is by far the largest single item in the native diet, the average amount of rice consumed is now less than it used to be. From 1856 to 1880 the average annual consumption per head was 251 lbs., but in 1927 it was only 218 lbs.; from 1916 to 1927 the proportion of rice in the average native diet fell from 51 to 42.5%. This fall in rice consumption has been due to an increase in the amount eaten of other vegetable foods such as cassava and soya beans. The trend towards a more mixed, and therefore better balanced, diet is shown in Fig. 32.

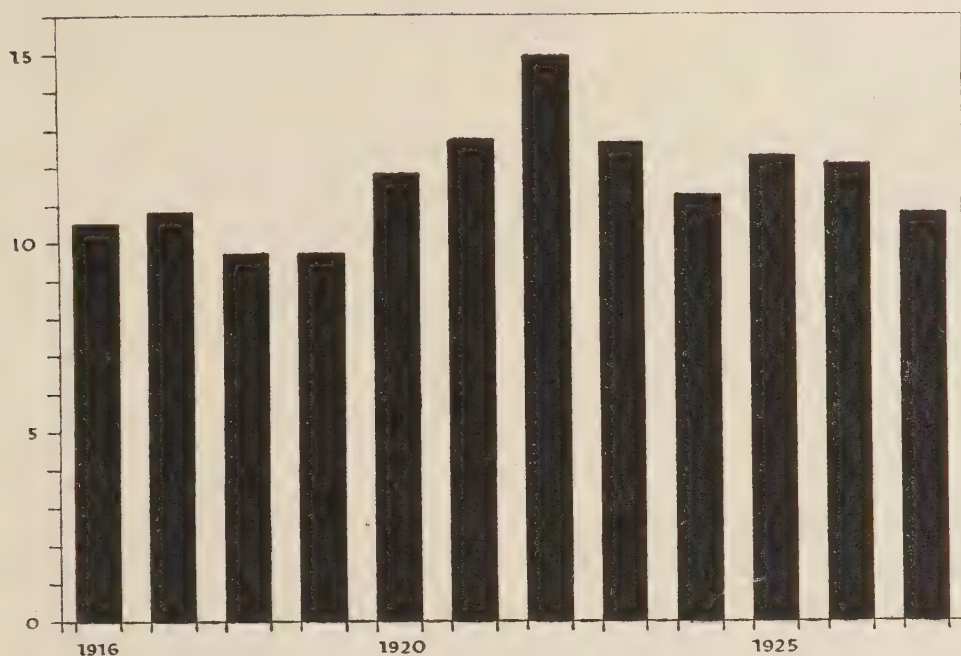


Fig. 31. Proportion of pulses in native diet

The total of starchy foodstuffs is taken as 100 for each year. Though the diet is becoming more mixed, there is no upward trend in the consumption of pulses.
Source: as for Fig. 30.

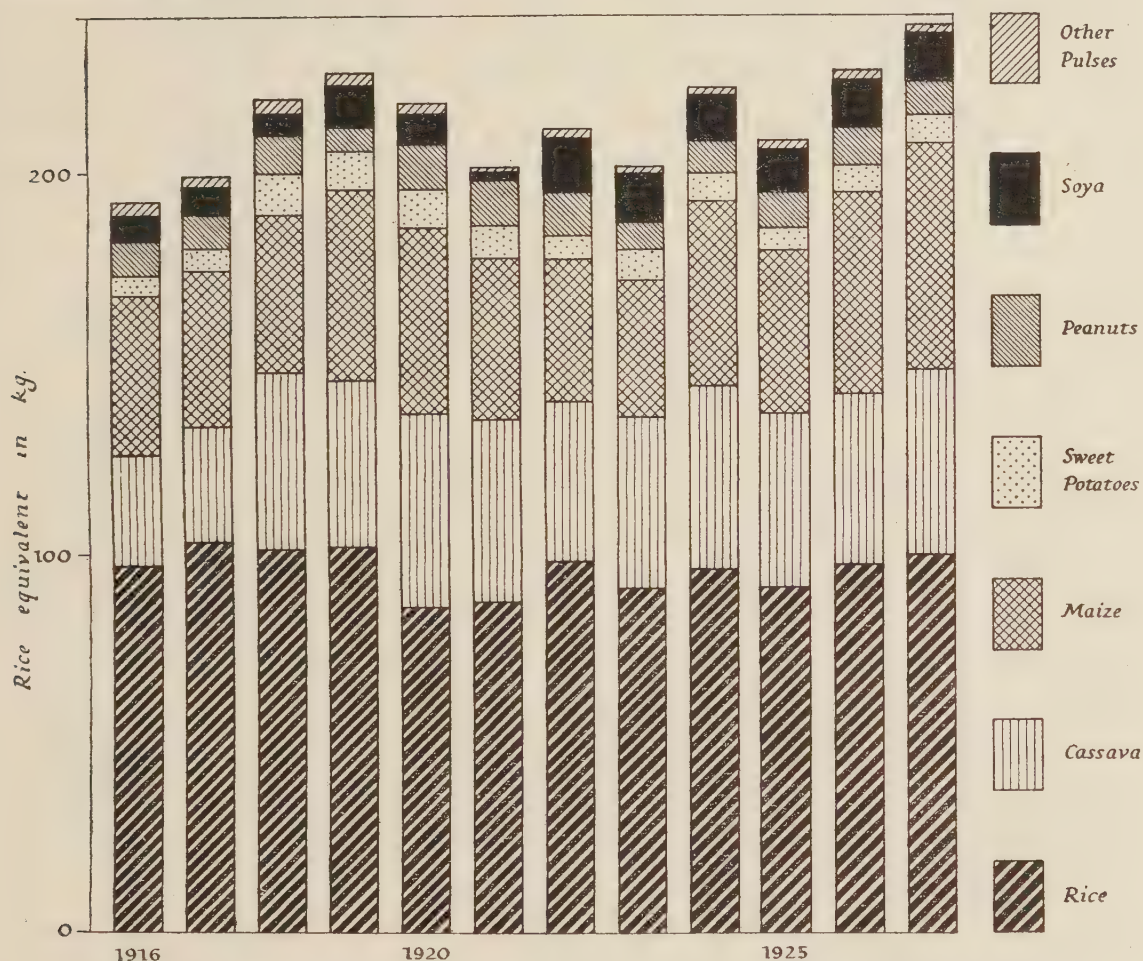


Fig. 32. Consumption of vegetable foods per head of native population

The foods are expressed in terms of calorific values on the basis of carbohydrates 1, protein 5.5 and fat 2.3. Thus, if 1 kg. of rice = 100, 1 kg. of cassava is 32, sweet potatoes 23, maize 112, soya 234 and peanuts 247.
Source: as for Fig. 30.

Cultivation

The rice plant can only grow under comparatively moist conditions, but provided the climate is sufficiently wet, as it is throughout the greater part of the Netherlands Indies, two methods of cultivation are possible, the 'dry' or *ladang* (also called *tegal*, *hoemah* or *gaga*) system and the 'wet' or *sawah* system. In the 'dry' system the seed is sown in ordinary soil, preferably on newly cleared forest land; in the 'wet' system young plants are transplanted into flooded fields. Different varieties of rice, adapted to different conditions of growth, are used in the two methods. 'Dry' cultivation is the simplest and probably the oldest form of rice cultivation, but the average yield is only about 4.6 cwt. per acre as compared with about 7.8 by the 'wet' method; it is also much more dependent on variations in the weather and the soil. Because it soon exhausts the ground, 'dry' cultivation is generally shifting and leads to reckless clearing of the forests. For this and other reasons it has been discouraged by the government. In Java and Madoera 7,856,400 acres of rice land were cultivated in 1927 on the 'wet' system and 1,202,975 on the 'dry' (Fig. 33). In recent years 'dry' cultivation has increased because the growth of the population has made an expansion of rice production necessary when all land suitable for 'wet' cultivation is already occupied. Outside Java 'wet' cultivation is practised in Sumatra and central Celebes, but elsewhere among the more backward native peoples it is almost exclusively the 'dry' method which is found.

The *sawah* or 'wet' rice fields are divided into compartments by low dykes which allow them to be flooded or drained at will. They are found both in the plains and on hill slopes up to about 3,500 ft. As a rule they are arranged in embanked terraces which hold the water or allow it to flow through sluices from one terrace to another. The water supply may be rain only, or it may come from rivers by means of irrigation canals (Plates 35-7).

On fertile land there may be two rice crops in the year, but often secondary crops, of which the chief are maize and peanuts, are grown alternately with the rice. The rice seed for the *sawah* is generally sown in the seed beds in October, at the beginning of the rainy west monsoon; planting follows as soon as the fields are sufficiently saturated to be cultivated, which may be in October or as late as January or February. The harvest is reaped from three and a half to six months after the planting-out of the young plants.

The young plants are usually laid out on the wet soil by the men,



Fig. 33. Distribution of *sawah* rice and of dry rice in Java and Madoera
Source: *Indisch Verslag*, 1938, vol. II, pp. 240, 260 (Batavia, 1938).

but the actual planting is done by women. If the rain begins to decrease in March or April the crop may suffer from lack of water, hence better yields are usually obtained from irrigated fields than from those supplied by rainfall alone, especially in the drier eastern part of Java. The harvest is reaped by women and the reapers are paid by a share in the harvest, varying from one-tenth to one-fifth.



Fig. 34. Harvesting rice, Bali

Drawn from a photograph.

The harvest season and the following time when the rice is stamped or pounded is a period of rejoicing among the natives, during which feasts are held and marriages celebrated. After the rice has been stacked and dried it is threshed and then peeled or hulled in a mortar; finally the grain is separated from the bran by winnowing. The portion of the crop not needed for local consumption is generally sold to middlemen or brokers, who re-sell it to Chinese rice mills where the threshing, peeling and winnowing are done by machinery operated by water power or buffaloes.

Rice cultivation as carried out in Java is essentially a communal

activity, carried out by the *desa*, or village co-operatively. Thus, there are common seed beds and in many villages seed is lent to the cultivator from a common store.

Rice culture in the Netherlands Indies is entirely in native hands and is so closely bound up with the traditions and religion of the

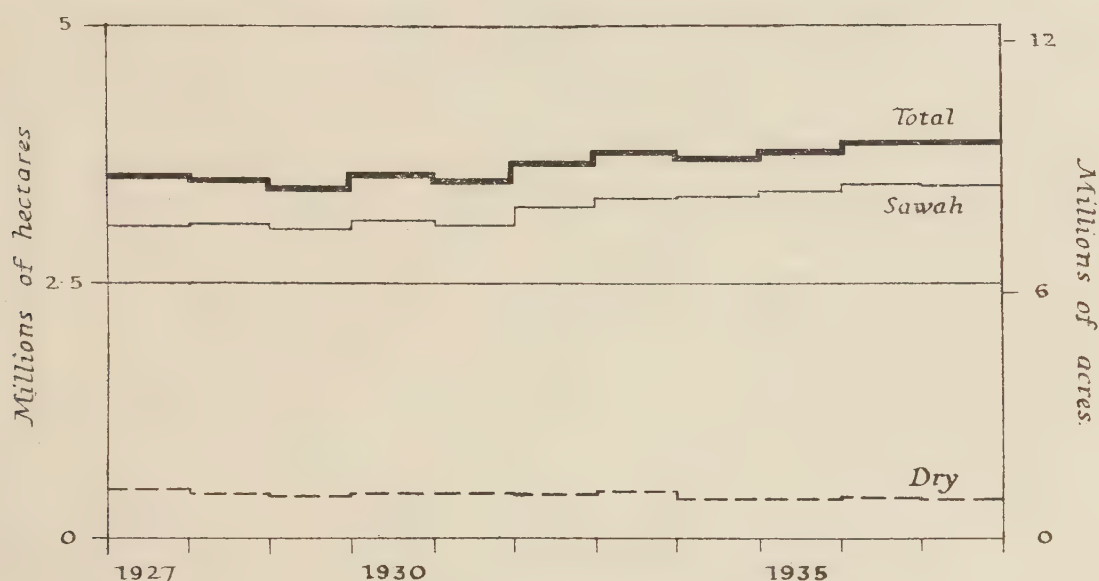


Fig. 35. Area under rice (*sawah* and dry)

Source: *Indisch Verslag*, 1938, vol. II, p. 265 (Batavia, 1938).

people that it has been difficult to persuade them to modernize their methods of cultivation. The government has, however, been untiring in its efforts to increase the yield of the rice fields by scientific research and by educating and assisting the cultivator in every possible way. Efforts have been made to make the natives abandon the traditional wet seed bed for the more efficient dry type. In some districts the native plough has been superseded by more modern implements.

Research has been carried out into the possibility of improving the yield by manuring. In ordinary native practice rice is not manured, except on very poor soils which may be given a dressing of dung or refuse. It has been found, however, that certain types of soil are deficient in phosphates and give a considerably higher yield when manured with superphosphate. It is estimated that there are over 2,500,000 acres of phosphate-deficient land in Java and over the whole of this area an average increase of 5.8 cwt. per acre could be obtained by using phosphate fertilizers. Other soils, for instance the sandy *gesik* soils and the younger volcanic soils, tend to be deficient in nitrogen and benefit from green manuring with leguminous crops. The difficulties in raising the rice yield by manuring are economic

rather than technical; the native lacks the capital to pay for fertilizers and the price of the crop is so low that their use is uneconomical unless the resulting increase of yield is large.

Pests and Diseases

Considerable losses to the rice crop are due to diseases and pests of various kinds. Birds and mammals—particularly field rats and rice birds—eat the grain. More important than these are various insect pests and the disease called root rot or *mentek*, which is not due to a parasite, but is physiological maladjustment prevalent under certain environmental conditions. The worst insect enemies of *sawah* rice are the white rice-borer (*Scirpophaga innotata*) and the rice bug (*Leptocorisia acuta*). Different pests attack 'dry' rice fields; the most serious in the lowlands is the white grub *Holotrichia helleri*.

These various pests are responsible for considerable fluctuations in rice production from year to year, but as they are mostly local in incidence in any given year, there is never a failure of the crop over the whole of Java, though there may be a failure over a whole district. Scientific work has shown that losses due to some of these pests can be much reduced by quite small changes in the usual methods of cultivation; for instance, with the white rice-borer it is sufficient to delay the date of sowing the crop. This insect remains dormant in the stubble for four to five months after the harvest; the adult moths emerge four to six weeks after the first shower of the west monsoon and emergence is complete within another fortnight. It is found that if the sowing of the rice is postponed till after all the moths have emerged, the crop will remain practically free of borer infection. In some districts the government has compelled the natives to delay sowing until tests with light traps have shown that nearly all the moths have emerged. This has proved to be an effective way of controlling the pest and only involves a delay of two or three weeks in the usual time of sowing.

Rice Breeding

Besides improving the methods of cultivation and controlling pests there is a possibility of increasing production by improving the rice plant itself, by means of breeding and selection. This has been one of the chief aims of the Experimental Station for Rice and Secondary Crops set up at Buitenzorg in 1905. For several reasons, the task has proved to be exceptionally difficult, but in recent years strains of rice have been obtained which yield up to 25% more than the unselected varieties ordinarily grown. Even when a good variety has been

successfully grown under experimental conditions there are all kinds of practical difficulties to be overcome before it can be spread over a large extent of country. As rice is a wind-pollinated plant it is impossible to keep a selected variety pure, because crossing with inferior varieties cannot be prevented. Further, the natives often fail to save any seed of the good varieties for next year's sowing, but eat or sell their whole crop, so that they are compelled to borrow or buy seed which may be of very poor quality.

Yield and Production

The average yield of rice per unit area in the Netherlands Indies



Fig. 36. Rice production

Source: M. B. Smits, 'Rice imports of the Netherlands Indies' *Proceedings of the 4th Pacific Science Congress, Batavia-Bandoeng, 1929*, vol. IV, pp. 236-37 (Batavia-Bandoeng, 1930).

compares favourably with that of most other rice-growing countries. About 17 cwt. of unhusked rice per acre may be taken as an average figure for Java and Madoera; only Italy and Japan can show higher figures than this. The yield shows large local variations and in Java both the lowest and the highest figures are found in the eastern part of the island. Particularly low yields are found in Madoera and in Rembang, eastern Semarang and other districts with a poor limestone soil. Higher yields than any of those in Java are found in parts of the Outer Provinces, as, for example, in Bali and the west coast of Sumatra. The total production of rice in the Netherlands Indies has fluctuated widely, depending on a large number of economic factors. In 1940 it was estimated at 13 million tons, of which 8 million came from Java. Before the depression of 1930-37 there was a tendency for rice cultivation to give place to the growing of crops for export, but when prices began to fall and crowds of labourers returned home from plantations abroad, the demand for rice grew. At the same time land formerly used for growing sugar became available for rice. The area of *sawah* rice in Java rose from 7,787,450 acres in 1929 to 8,989,900 acres in 1937 and the estimated production from 6·3 to 7·4 million tons. The changes in the area of rice cultivated and in the yield are shown in Fig. 35.

The Netherlands Indies both import and export rice, but the quantity imported greatly exceeds the quantity exported. Java rice, of which the best qualities are grown in the Indramajoe and Cheribon districts, commands a good price in the European market. The imported rice is of lower quality and comes chiefly from Siam, Indo-China and British India. In 1927 the excess of imports over exports of rice was 469,761 tons of clean rice, while by 1937 it had fallen to 100,889 tons.

SUGAR-CANE

Sugar-cane is one of the most important agricultural products of the Netherlands Indies. About 1·5 million tons are grown yearly, of which about 1·2 million are exported. Sugar forms about 8-10% of the country's exports and about 12-13% of world sugar exports. The sugar-cane is cultivated on a small scale by the natives throughout the East Indian islands, but on a commercial scale it is cultivated almost entirely on European-owned plantations in Java. The leading position which the Netherlands Indies have held among sugar-growing countries is due partly to the efficiency with which the



Fig. 37. Distribution of sugar-cane and sweet potatoes, Java and Madoera
Source: *Indisch Verslag*, 1938, vol. II, pp. 240-260 (Batavia, 1938).

industry is organized and partly to the extent to which the results of scientific research have been utilized.

Cultivation

The successful cultivation of the sugar-cane demands a good water supply during the growing season and dry weather for the harvest. For this reason practically all the sugar estates of Java are concentrated in the lowlands of the east and centre of the island where the influence of the east monsoon is strongly felt. The greatest number of factories and the largest area under sugar are in Soerabaja Residency; the western limit of cultivation is approximately the Tjimanoeck. Over much of this area there are less than twenty days of rain in the four driest months of the year; very few estates lie in the region with over thirty rainy days in the dry season (Fig. 37).

Though the natives grow sugar-cane in small quantities both on 'dry' fields and *sawah*, large-scale cultivation is almost entirely on irrigated land. The ratoon system, under which the cane is cut down and a second crop allowed to sprout from the same roots, is unknown in Java, sugar being grown on a three-year rotation with rice and other crops, so that at any one time only about a third of the sugar-growing area is actually planted with cane. The land used is generally rented by the planters from the natives who, while cultivating sugar for the factories, continue to grow their own crops on the two-thirds of the land not being used for sugar. After the harvest the land returns to the natives and another third is rented by the planters (Plate 38).

Planting is done in the dry months between April and October, under European supervision. When the crop is ready to cut, about a year later, the natives harvest it and deliver it to the factories. As most of the sugar-growing districts are densely populated labour is plentiful. The men do the heavy work, the women cut the canes and do weeding and watering, while children are employed on catching insects and other light jobs. Before the slump in 1929 over 60,000 permanent hands were employed and over 700,000 temporary hands during the harvest or 'campaign'. The manufacturers pay wages for cultivation and additional wages for harvesting, as well as rent for the land. On a large estate the annual working expenses are about £ 3 million, of which the natives receive about £ 1 million in wages and £ 130,000 in rent.

Yield and Production

Before the slump in 1929 there were 179 sugar factories in Java, many of them with excellent modern equipment and highly expert

European staff. The number fell to 43 in 1935 but had risen again to 64 by 1937 (Plate 39). A network of light 'Decauville' railways connects the factories with the growing areas (see vol. I, p. 177, of this Handbook). There are two experimental stations for the sugar industry which deal with the diseases of the sugar cane (the chief being *sereh*, a disease of the vascular tissues, and *dongkellan* or root rot), with the breeding and selection of new varieties and with other problems of sugar cultivation. The large amount of attention given to research by the Java sugar manufacturers has been very fruitful in results; a measure of its success is the steadily rising figures of production per acre. In 1840 the average production was 15·8 cwt. per acre; in recent years it has been about 104 cwt. The famous variety known as 2878 POJ, raised by the Pasoeroean Experimental

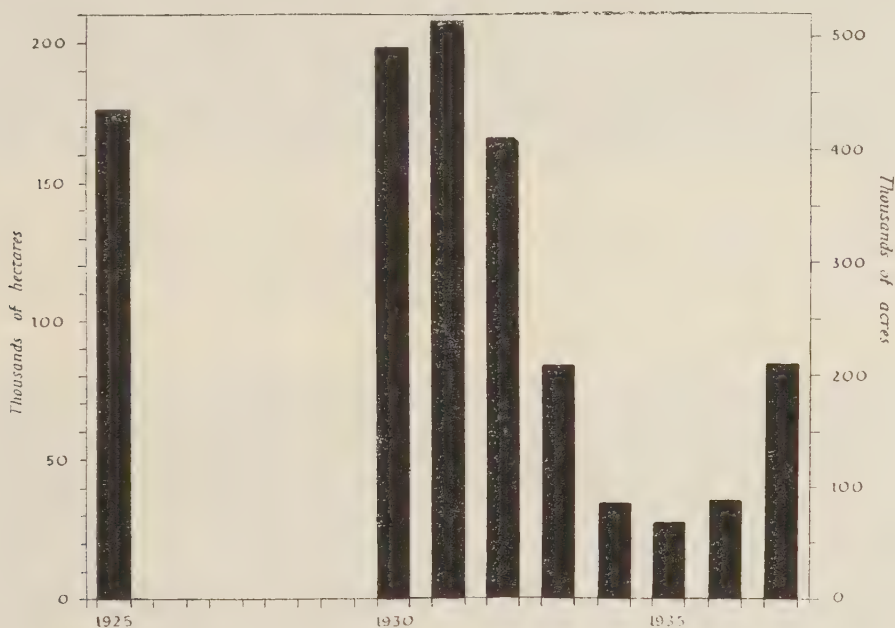


Fig. 38. Java and Madoera. Area under sugar, 1925-37

Source: *Indisch Verslag*, 1938, vol. II, p. 197 (Batavia, 1938).



Fig. 39. Java and Madoera. Sugar production, 1925-37

Source: *Indisch Verslag*, 1938, vol. II, p. 197 (Batavia, 1938).

Station in 1926 has an average production as high as 128 cwt. The area under sugar-cane and the production of sugar from 1925-37 are shown in Figs. 38-9.

Organization

Since sugar was established as the main export crop of Java under the Culture System, the industry has had a chequered history. The financial crisis of 1884, due to an epidemic of *sereh* disease in the previous year, led to the adoption of a common policy among the sugar planters and to the establishment of experimental stations. A further crisis in 1895 led to the formation of the General Syndicate of Sugar Manufacturers which in 1912 took over the management of the experimental stations. The whole industry thus became in effect a single very large corporation. A further advance in organization was the creation in 1918 of the Association of Java Sugar Producers to act as a central sales organization. The world depression of 1930 hit the sugar industry extremely hard and the area cultivated fell from 697,670 acres in 1931 to 66,720 in 1935.

Up to 1874 Java sugar was exported almost entirely to the Netherlands, but later, owing to the development of the beet-sugar industry in the home country, exports became diverted to Great Britain, British India and other countries.

Palm Sugar

The natives eat little sugar-cane, but prefer sugar made by evaporating the sap of certain palms, in Java chiefly the *areng* (*Arenga saccharifera*), in the more eastern islands the *lontar* (*Borassus flabellifer*). The palm sugar is dried, wrapped in leaves and sold in the native markets.

RUBBER

Rubber is the most important of the industrial raw materials produced in the Netherlands Indies and one of the most important agricultural crops of the country. Before the Japanese invasion in 1942 some 1,729,700 acres of rubber were grown by the natives and some 1,482,600 acres by European planters (1,200 estates). There were 720,000 registered native rubber farmers and it was estimated that between five and six million people (native labourers and their families) depended on rubber for their cash income. The largest areas of rubber are in Java and Sumatra, but an increasing amount of rubber is being grown by the natives in Borneo and elsewhere. The



Plate 38. Sugar-cane ready for harvesting, central Java
The volcano G. Merapi can be seen through the clouds in the background.

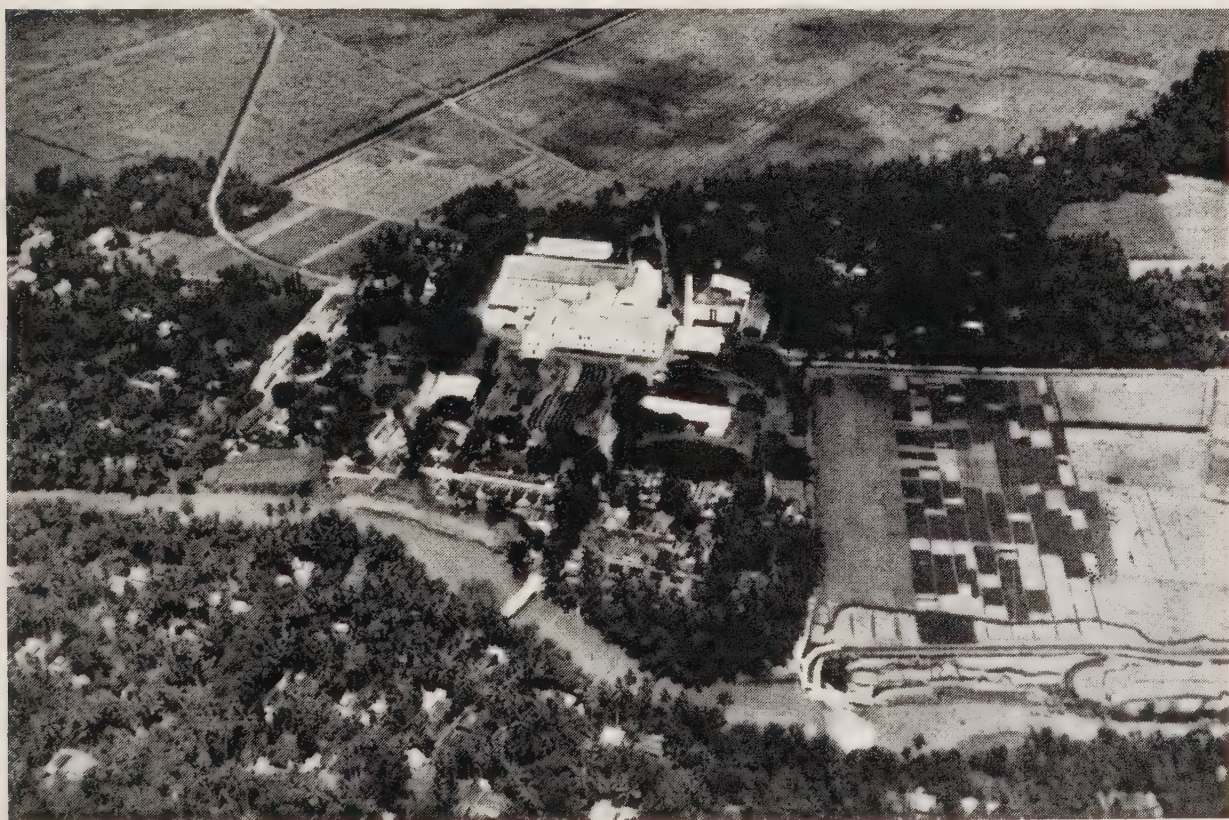


Plate 39. Sugar plantation and factory near Jogjakarta



Plate 40. Rubber plantation, Oostkust Residency of Sumatra

This plantation is in the lowlands between Tebingtinggi and Tandjoengbalai. The trees are six years old.

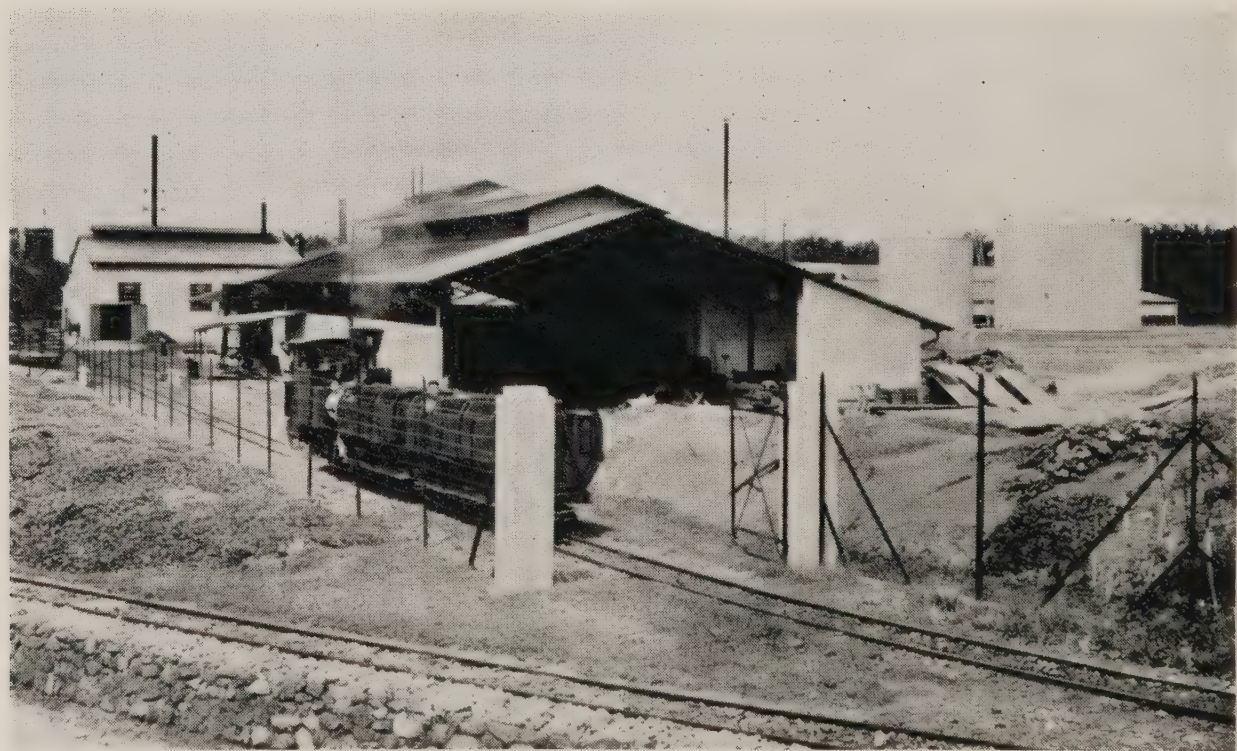


Plate 41. Palm oil factory near Pematangsiantar

rubber tree likes a hot climate; in Java most plantations are situated about 1,500 ft. above sea-level, rarely lower or higher, but in Sumatra, where rubber has not taken the place of any other crop but has been planted in clearings in the primitive forest, most of the plantations are at less than 1,500 ft.

In the latter part of the last century several plants such as the fig, *Ficus elastica*, and the ceara rubber, *Manihot glaziovii*, were tried in the Netherlands Indies as rubber producers, but these have been more or less completely superseded by the much more productive Para rubber, *Hevea brasiliensis*. This was first introduced into the Buitenzorg Botanical Garden in 1876 and the first plants were probably grown from the batch of seeds brought from Brazil to Kew by Henry Wickham, from which the first plantations in British Malaya also originated.

The rubber tree may grow to a height of over 60 ft. and the rubber is obtained from the trunk by making cuts in the bark (tapping). The latex, the milky juice which drips from the cuts, is collected and treated to make it coagulate. It is then made into sheets or lumps which are exported. Various systems of cultivation are practised; often a leguminous crop is grown under the trees as a green manure and ground cover. The natives often interplant the young rubber trees with a catch-crop while they are maturing. In the lowlands the tree takes four or five years, and in the hills a year or two longer, to reach a size at which it can be tapped. The highest yielding capacity is not reached till eight to fourteen years, but once reached it is maintained for many years.

Much experimental work has been done in Java with a view to selecting high yielding strains of rubber resistant to the various diseases by which it is attacked. As the tree is easily propagated by budding as well as by seed, there is a possibility of budding a strain on to a stock on which it may grow better than on its own roots. All such efforts at improvement are slow in giving results owing to the long time which must elapse before the performance of a tree can be judged, since it is impossible to distinguish low yielding from high yielding trees till they are old enough to be tapped.

Most of the rubber is prepared in the form of smoked sheets about 3 to 3½ mm. thick, but some of the older estates still keep to the old method of making pale crepe. Recently the Hopkinson spraying process has been introduced, but it can only be carried out on a very large scale and only two factories, one in Java and one in Sumatra, have adopted it.

From about 1905, when rubber first began to be extensively grown, till about 1915, rubber was grown only on European-owned estates, but the success of the early plantations encouraged the natives also to plant it. After the war of 1914-18, production greatly expanded and a great opportunity was given to planters and natives alike when in 1923 the Stevenson Restriction Scheme was introduced in Malaya, but not in the Netherlands Indies. During the economic crisis of 1930-37, however, the output was restricted in the Netherlands Indies also (see p. 313). In bad times many of the native rubber plantations are merely abandoned and, as the rubber tree is hardy and survives long periods of neglect, tapping can be resumed when prices again offer an inducement. The European estates on the other hand have heavy overhead charges and must carry on, even at a loss; it is doubtful whether their more scientific methods of cultivation are economically justified. For these reasons their share in rubber production seems likely to diminish and the industry may in time become an entirely native one.

VEGETABLE FATS AND OILS

The Netherlands Indies are large producers of vegetable fats and oils. The chief oil crops are the coconut and the African oil palm, while peanuts (groundnuts), soya beans, sesamum and kapok seeds are also grown.

Coconuts

The coconut palm is indispensable to the natives in innumerable ways, providing a range of commodities varying from cooking oil and fruit to thatch. In European commerce only two coconut products are of significance, copra, the dried 'meat' of the nut from which the oil is extracted, and the oil itself which is used in large quantities in various industries. World exports of copra amount to some two million tons and of these nearly a third comes from the Netherlands Indies.

The coconut palm does not require elaborate cultivation and is mainly a plant of coastal districts, preferring climates without a severe dry season. Nearly all the islands of the East Indies are fringed with a belt of coconut palms and in some places there are extensive plantations inland up to a height of about 2,300 ft. above sea-level. Coconuts are widely grown in Celebes, especially the Minahasa district, Borneo, the Atjeh and Oostkust districts of Sumatra and

in some of the smaller islands such as Talaud and the Anambas and Natoena islands, some of which are almost entirely covered with coconuts. Until recently coconut-growing was almost entirely a native industry, but the huge demand for copra has encouraged European planters to take up the cultivation on a large scale. Copra-drying is a simple process, carried out in the sun or over fires in drying sheds. The extraction of oil is carried out in factories, or by crude native methods. Spent copra or *boengkil*, from which the oil has been removed, is used as a cattle food.

Two experimental stations in the Netherlands Indies are concerned with the problems of coconut cultivation, but there is still a great lack of scientific knowledge as to diseases, varieties and the best methods of cultivation. Great differences in yield between different trees can be observed and rough methods of selection, such as buying seed from estates which are known to have a high average production, have long been practised. Scientific selection promises good results, but there are various difficulties, the chief being the long time (at least five years) the trees take to bear fruit.

Oil Palms

Oil palm cultivation in the Netherlands Indies has had an astonishingly rapid development. Though large-scale cultivation only began in 1911, the Netherlands Indies have become the largest producer of palm oil in the world, furnishing in recent years about 250,000 tons out of a total world production of 550,000 tons. Oil palms are not a native crop like the coconut, but are grown entirely on a large scale in plantations, the chief centres of production being in the Atjeh and Oostkust Residencies of Sumatra. The total area cultivated is about 123,550 acres. The variety mostly grown is the so-called Deli type, which is the progeny of seed imported from Réunion or Mauritius in 1848 by the Buitenzorg Botanical Garden. An experimental station is occupied with problems of breeding and selection. By skilful cultivation an average production of 1.19 to 1.39 tons of oil per acre has been achieved, which makes the oil cheap and well able to compete with other vegetable oils and fats. Palm oil is exported. The problem of transport was at first difficult, but it has been solved by the use of oil tankers (Plate 41).

Other Oil Crops

Except for kapok seeds, which come from a tree and are a by-product in the production of kapok fibre, the other oil crops, peanuts, sesamum and soya beans are all annual plants. The cultivation

of all of these crops is entirely in native hands. Peanuts are grown chiefly on the *sawah*, in rotation with rice, particularly in east Java (Fig. 41). Considerable quantities of the oil are exported, mainly for use in the manufacture of margarine. Improved rapidly maturing varieties have been introduced.

COFFEE

Coffee was introduced into Java as long ago as 1699 and during the eighteenth and most of the nineteenth century it was the chief export crop of the country, not taking second place to sugar till 1885. Since that year coffee cultivation has greatly declined, mainly owing to the exhaustion of suitable soils, and to the attacks of diseases which have made the yield uncertain. Other causes have been the fluctuation of the market and the competition of other countries, particularly Brazil. At the present time, however, considerable amounts of coffee are still grown, particularly in east Java, central Sumatra and Celebes. Under the Culture System, coffee became a government monopoly and cultivation directly by the government did not finally disappear till 1919. From 1880 onwards coffee growing was taken up more and more by private planters and in the last few years native-grown coffee has become increasingly important, especially in the Palembang Residency and other parts of Sumatra. Coffee growers now realize that the crop is a speculative one and generally combine it with the cultivation of tea, rubber, cinchona and other crops.

The only type of coffee grown in Java until the latter part of the last century was Arabian coffee, *Coffea arabica*. In 1876 a leaf disease, due to the rust fungus *Hemileia vastatrix*, was noticed in Sumatra and soon spread to Java. It is estimated that between 1884 and 1888 damage amounting to 100 million guilders was done and it soon became useless to grow coffee, except at high altitudes where the effects of the disease were less devastating. Great efforts were made, first by introducing new types of coffee from abroad, later by selection, grafting and hybridization, to find high yielding coffees which were resistant to disease. *Coffea liberica* was introduced from West Africa in 1876 and later *Coffea robusta* from the Congo. The first government experimental station for coffee was started in 1901 near Malang and afterwards several other stations were established by the government or by the planters themselves. The efforts to improve the coffee plant have not been entirely unsuccessful and at the present time a range of

types suited to different conditions are grown, *liberica* types on heavy soils and at low altitudes, *robusta* types on more porous soils particularly between 1,000 and 2,500 ft., *arabica* types on young volcanic soils at still higher altitudes. Besides the leaf disease, the coffee tree easily falls a victim to several other pests, of which the worst are nematode worms and since 1918 the boring beetle *Stephanoderes hampei*. In improvement experiments resistance to all these pests has to be taken into account.

TEA

Tea has long been grown in Java. Freed from government control in 1865, the tea industry soon made rapid progress. For some years it was mainly in British hands and it was to develop the tea plantations that foreign capital was first attracted to the Netherlands Indies on a considerable scale. When the coffee plantations were ruined by disease many Dutch planters took to growing tea in place of coffee. In the last few years the tea production of the Netherlands Indies has been about 85,000 tons per annum, 15 % of the total coming from native growers, who sell most of their product to the planters for processing in their large and well-equipped factories (Plate 42).

The tea tree or bush demands a soil rich in humus and a not very hot climate with a high rainfall throughout the year. These conditions are found in the mountains of west Java between 2,000 and 6,500 ft., particularly in the Preanger Highlands, and in the native principalities or *Vorstenlanden*. Trees taller than tea are grown in the plantations to give the necessary shade. Outside Java a thriving tea industry has grown up since 1911 in the Oostkust Residency of Sumatra; the neighbourhood of Pematangsiantar has become especially noted for its high productivity. The large amount of labour (mainly female) needed for the cultivation is easily obtained in the well-populated districts where tea is grown.

In the early days of tea growing in Java only China tea was planted, but since 1873 the large-leaved Assam tea has taken its place because of its higher productivity and greater popularity in foreign markets. Till recently all tea seed was imported from growers in India, but efforts have been made to produce seed locally. The government has considerably improved methods of cultivation and by selection is trying to develop superior varieties of high productivity and resistant to the two chief diseases, the Assam tea bug, *Helopeltis*, and the red rust, *Cephaleuros*.

TOBACCO

Tobacco has been one of the chief exports of the Netherlands Indies for over fifty years. It is the main source of income in certain districts and some 6,200 acres are used for cultivating it. Tobacco is both an estate and a native crop. The estates grow high-quality, high-priced products such as the famous Deli leaf, used for wrapping cigars and reputed to be the finest tobacco of its class in the world. The native product is much poorer in quality and the yield is lower. Most of the native tobacco crop is used to satisfy the large local demand for cigarettes; the remainder can compete in the world market only because its price is low.

The European tobacco estates are situated chiefly in the Deli district of Sumatra (see p. 61 and Figs. 33 and 35 of vol. 1 of this Handbook), and in the native states and the Besoeki Residency in Java. The system of cultivation is different in these three areas. In the Deli district cultivation is extremely elaborate and much capital is invested in the industry. Planting is done on former forest land and the same piece of ground is planted with tobacco only once in eight years (Plate 43). In the native states of Jogjakarta and Soerakarta cultivation is also intensive, but less so than before the agrarian reforms of 1918 when labour was cheaper. Here the plant is chiefly grown on *sawah*. In the Besoeki Residency the planters supply native cultivators with seedlings and then buy the product for processing, sorting and export. In this district 'dry' fields are used.

SPICES

Spices, which in the seventeenth and eighteenth centuries were the best known product of the East Indies, to-day play a very small part in their economy. The most important of these crops is pepper, of which about 20,000 tons are produced annually in the Netherlands Indies. Pepper is grown mainly by the natives and Chinese, but some comes from European estates. The chief centres of the industry are in Sumatra, Borneo, Billiton and Bangka. Cloves are still grown, mainly by natives, in the Moluccas, the original 'Spice Islands'. They are also grown to some extent in Sumatra. Though there is a great demand for cloves in Java for flavouring native cigarettes, it is cheaper to import them from Zanzibar than to use cloves from the Moluccas. Nutmegs are grown as an estate crop both in Banda, to which the industry formerly brought much wealth, and in Java. They are also grown by the natives in Sumatra and Celebes.



Plate 42. Tea plantation and factory, Poerbasari

The rows of buildings on the left of the factory are the houses of the workers on the plantation.



Plate 43. Tobacco plantation near Medan

Seed-beds can be seen in the foreground. The two large buildings are tobacco-drying sheds.



Plate 44. Cinchona plantation near Bandoeng



Plate 45. Cinchona factory, Bandoeng

Among the spices may be included the pinang or betel nut, the fruit of the areca palm, which is everywhere chewed by the natives in Malaya and the Malay islands. The tree is grown on a small scale almost everywhere in the Netherlands Indies and from Sumatra considerable quantities are exported, mainly to Penang and Singapore, where they are consumed locally and also re-exported.

FIBRES

The chief fibres grown in the Netherlands Indies are kapok, which is obtained from the fruits of the randoe tree, *Ceiba pentandra*, sisal and cantala, both obtained from the leaves of species of *Agave*, and gemutu, the fibres of the sugar palm, *Arenga saccharifera*.

Kapok

The most important of the fibres economically is kapok, which comes chiefly from Madoera, east and central Java, south Sumatra, Celebes, Bali and Lombok, and is mainly grown by the natives. Kapok is a light and elastic down, it does not easily deteriorate and is used mainly for stuffing 'eider-downs' and upholstery and for life-saving equipment for ships. Synthetic hollow fibres (the so-called 'bulb fill') can be produced which are adequate substitutes, but the cost of production is much higher than for the natural kapok. The Netherlands Indies produce about 20,000 tons of kapok a year, 70 to 80% of the total world's production. The seeds, as already mentioned, yield a valuable oil and the residue after the oil has been extracted can be used as a manure.

Sisal and Cantala

Sisal and cantala are hard fibres used for making ropes and cord. Both are grown in Java and Sumatra and the Netherlands Indies takes second place after the British East African territories as a producer of sisal. The exported sisal goes chiefly to the United States, where it is largely used for making binder twine for sheaves. The demand thus varies with the size of the grain harvest and the introduction of the combined harvester which reaps and threshes in one operation has tended to reduce the demand for sisal.

Other Fibres

Gemutu resembles bristles rather than fibres and is coming into demand for brushware.

Cotton is widely grown in the Netherlands Indies, but mainly for the home market, little being exported.

DRUG PLANTS

Cinchona

The cultivation of cinchona, the tree from whose bark quinine is obtained, occupies a unique place in the agriculture of the Netherlands Indies. Already in 1886 Java was producing about two-thirds of the world's supply of quinine bark and in recent years between 90 and 95% of this drug, essential for the treatment of malaria, has come from the Netherlands Indies, the rest of the world's production coming from tropical America, the original home of the tree, and from British India.

The large share of the market for quinine captured by the Netherlands Indies is due, not to a monopoly of suitable soil or climate for growing the tree, but to careful organization, scientific methods of cultivation, and above all to long continued selection, which has made possible the production of bark with a very high quinine content and a low content of constituents which impede the extraction of the drug in a crystalline form.

The cinchona plantations are situated between 3,000 and 6,500 ft. above sea-level. In 1854 when the government, prompted by the increasing shortage of quinine, introduced the first cinchona plants into Java, the Pengalengan plateau near Bandoeng was chosen as the best site for the first plantation. After 1872, when a new and more productive type of tree was introduced, the cultivation was taken up by private planters as well as by the government, but this area has continued to be the main centre of production, though some cinchona is now grown on the west coast of Sumatra (Plate 44).

Till 1896 the bark was sold by public auction in the Netherlands and the extraction was carried out entirely by European manufacturers, but over-production and the formation of a 'ring' of manufacturers who combined to force down prices led to a crisis in the industry. As a counter-measure, a quinine factory was started at Bandoeng in 1898 and prosperity soon returned. In recent years production has been variable. In 1935 it was about 9,000 tons, in 1939 nearly 12,000 tons and in 1940 and 1941 it rose to 16,000 and 17,000 tons respectively (Plate 45).

Coca

Another important vegetable drug grown and manufactured in the Netherlands Indies is cocaine, which is extracted from the leaves of the shrub *Erythroxylon coca*. This grows well between 3,000 and 6,500 ft. in Java and is generally treated as a second crop or a catch

crop. The manufacture of the drug is carried out in factories both in Java and the Netherlands.

CASSAVA

Starchy foods other than cereals play a considerable part in native diet, as can be seen from the figures on p. 181; cassava, from which tapioca is obtained, is the chief of these foods and is also an important export crop. Cassava is grown chiefly in Java and Madoera and mainly by natives. It is cultivated both as a secondary crop on the *sawah* and on 'dry' fields. In 1937 it occupied about one-tenth of the total cultivated area and 7,637,400 tons of tubers were produced (Fig. 40). For many years the Dutch tried to encourage cassava cultivation, but with little success till about 1895 when the French began to buy cassava products for manufacturing cheap brandy. Later this practice was prohibited and the cultivation declined, but in recent years many new uses have been found for cassava and it has become an important export, the Netherlands Indies supplying from 70 to 85 % of the world exports. In native housekeeping the tubers play a similar part to the potato among Europeans. Cassava flour is manufactured both in factories and by the natives; the refuse (*ampas*) is used as cattle food. As well as the flour, the dried tubers (*gaplek*) are exported and meal made from unpeeled tubers is used both as cattle food and for making alcohol. Tapioca starch has peculiar properties and recently a number of important industrial uses have been found for it, such as in the making of mucilages and adhesives, in the sizing of textile yarns and in paper manufacture. For some of these purposes no equally cheap substitute is available.

MISCELLANEOUS CROPS

Maize and Millet

The only cereals of any importance other than rice are maize and millet. Large quantities of maize are eaten by the natives and there is a surplus which is exported. In Java and Madoera maize cultivation occupies about a quarter of the area under native cultivation (Fig. 40). Maize is also grown in Sumatra and Celebes, and in Timor it is the staple food crop. Millet is widely grown as a subsidiary crop and locally, where conditions are unsuitable for both rice and maize, it is a staple food.



Fig. 40. Distribution of maize and cassava, Java and Madoera
Source: *Indisch Verslag*, 1938, vol. II, p. 240 (Batavia, 1938).

Potatoes and Sago

English potatoes are grown by the natives in Java on a fairly large scale for European consumption; sweet potatoes on the other hand are grown all over the Netherlands Indies and are eaten mainly by the natives themselves. Sago is obtained from the stems of palms (*Metroxylon*) which grow wild, or are cultivated in a rough and ready fashion in most of the islands. In the Moluccas and in parts of New Guinea sago takes the place of rice as the staple food of the natives.

Cocoa

Cocoa has been cultivated in Java on a commercial scale since the latter half of the eighteenth century. At the present day it is grown chiefly in central Java; some of the land formerly used for it is now given over to rubber and other crops. The tree is somewhat exacting and subject to various serious diseases, but the product is of high quality and fetches a good price.

Pulses

The most important of the pulses is the soya bean or *kedele*, which has already been mentioned as a source of oil. It is chiefly grown on *sawah* in rotation with rice. The area under this crop rose in 1937 to 1,225,300 acres (Fig. 41).

Indigo

Indigo as a crop is now of historical interest only. Under the Culture System, indigo cultivation was one of the most laborious tasks imposed on the natives; later, indigo was largely grown on private estates. Synthetic indigo was discovered in 1875 and became a commercial product about 1896. After that date, indigo exports from the Netherlands Indies rapidly declined and now synthetic indigo is imported even for local use.

Essential Oils

Essential oils are exports of some importance. Among a number of such oils produced in the Netherlands Indies the chief is citronella oil which is obtained from the *sereh* grass (*Cymbopogon nardus*). The production of this oil, used as a perfume for soap and in manufacturing synthetic 'attar of roses', has been recently about 2,500 tons a year. *Sereh* grass is grown chiefly in west Java, mostly on small plantations in mixture with other crops.

Gambir

Gambir or white cutch is a scrambling plant which is extensively

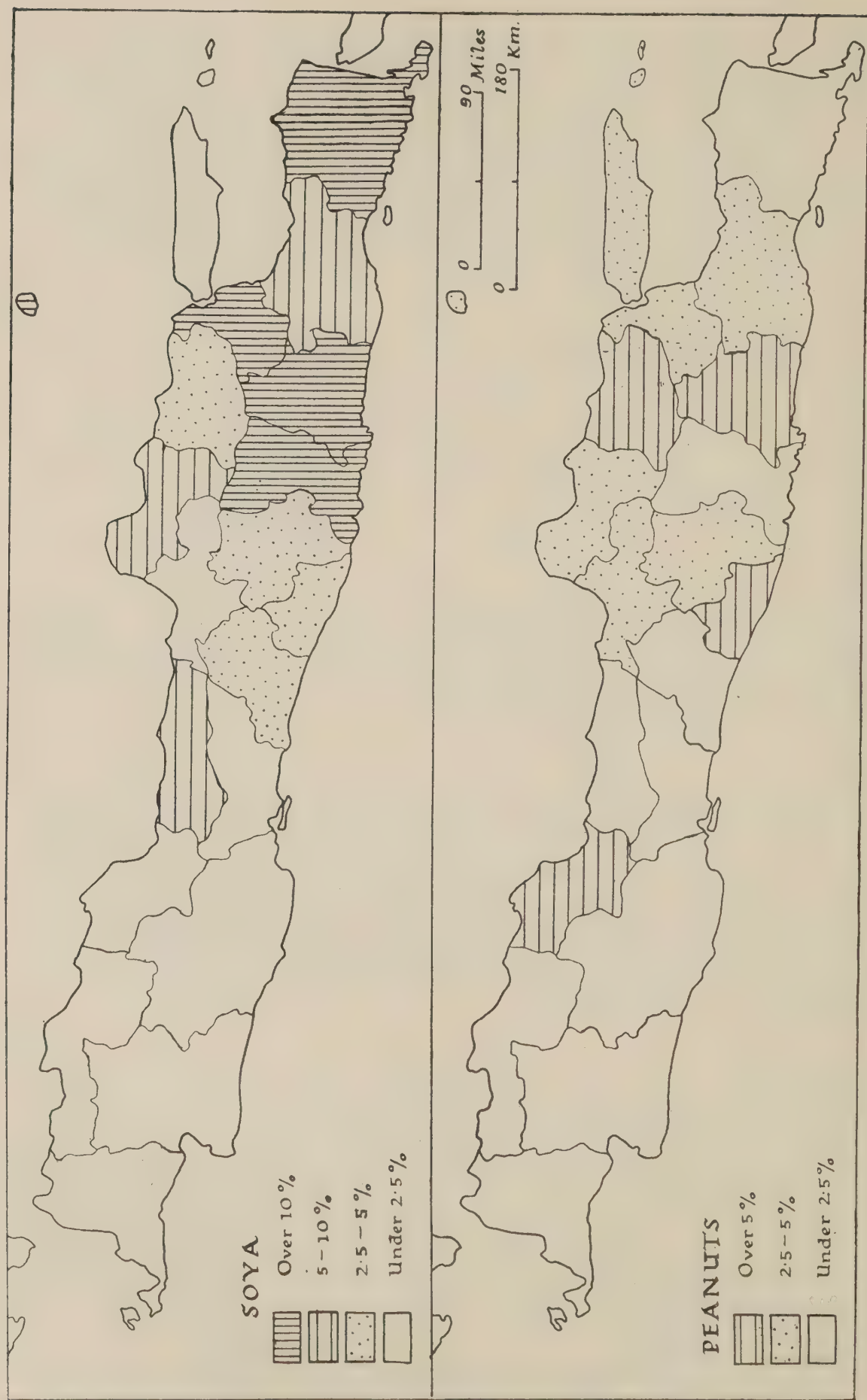


Fig. 41. Distribution of peanuts and soya beans, Java and Madoera
Source: *Indisch Verslag*, 1938, vol. II pp. 249, 260 (Batavia, 1938).

cultivated in Sumatra, Riouw and west Borneo; it also grows semi-wild in some places. It is used as an astringent to chew with betel nut and yields a brown dye, but its main importance is as a source of tanning material, of which large quantities are exported to Europe.

LIVESTOCK

After crop-growing the rearing of livestock is one of the chief means of livelihood of the native population, particularly in certain districts. The cattle are used mainly as draught animals, either in the fields or for road transport, meat production being of secondary importance. Milk is used only by Europeans and dairying is little practised. The competition of the motor-car has led to some diminution in the demand for draught cattle; on the other hand, the extension of the road system into the interior of most of the islands has widened the area in which they can be used. To the natives, cattle are valuable not only for their usefulness as such, but also as an investment for savings. Cattle are considered a safe possession and can easily be converted into cash when the need arises.

CATTLE

Cattle are very unevenly distributed over the islands, as the following figures (for 1937) show:

Islands	Oxen	Buffaloes	Total
Java and Madoera	3,537,106	2,015,771	5,552,877
Sumatra	353,077	365,500	718,577
Borneo	27,693	34,894	62,587
Celebes and Moluccas	135,510	407,245	542,755
Lesser Soenda islands	360,220	373,944	734,164
Total	4,413,606	3,197,354	7,610,960

Source: *Indisch Verslag*, 1938, vol. II, p. 277 (Batavia, 1938).

The greatest density of cattle is in Java (116 per sq. mile) and Madoera (311 per sq. mile). On the small island of Sapoedi, off the coast of Madoera, it is as much as 453 per sq. mile. In some districts of the Netherlands Indies the density thus equals or exceeds that in the richest cattle breeding regions of Europe.

Buffaloes are more powerful than oxen, but less capable of prolonged effort and less tolerant of the midday sun; they are

particularly useful for hauling timber and for cultivating marshy ground, but for permanent cultivation on the lighter soils they are gradually being displaced by oxen. The increasing use of oxen is especially noticeable in Java, though even here buffaloes still predominate in the west, whereas in the rice-growing plains of the east oxen are far more numerous. In Madoera, where the people specialize in cattle breeding, oxen outnumber the buffaloes still more. In the Outer Provinces, where cultivation is backward, there are more buffaloes than oxen, except in a few areas, such as the Atjeh Residency in Sumatra, the Minahasa district near Manado in Celebes, and Bali. In Borneo, cattle of all kinds are little used; there are only 0.3 per sq. mile.

Both oxen and buffaloes are bred. Ordinarily cattle breeding is a secondary occupation subsidiary to other forms of agriculture, but in the Bantam and south Preanger districts of Java herds of 40 to 100 buffaloes may be seen and near the large towns there are herds of cows. In cultivated areas one man rarely owns more than half a dozen cattle and sometimes only one or two. Many European plantations keep their own buffaloes for haulage; in Deli (Sumatra) every plantation has its own herd, imported originally from India, and it was to meet the European's demand for milk that cattle were first imported from abroad. When the Agricultural Department was formed in 1905 the experience gained by the planters was at its disposal.

Most of the oxen in Java derive originally from the banteng (*Bos sondaicus*) which is still found wild in places from Bantam to Besoeki; there are also wild oxen in Borneo, probably the descendants of Bali cattle which have run wild, and a type of dwarf wild ox in Celebes. Among the domesticated cattle those of Bali are a distinct type closely related to the banteng; all the others are grouped together as Javanese with three recognized varieties, the true Javanese, the Sumatran and the Madoerese. All the cattle have been largely crossed, especially in recent years, with imported animals, chiefly from British India.

Before the formation of the Agricultural Department little had been done, except by the planters, to improve the local stock. The cattle had been left to run wild over the extensive grazing grounds, but with the spread of cultivation in Java stall feeding had to be adopted, though breeding was still left to nature. There was, moreover, a Muslim prejudice against castration, though in Hindu Bali castration had long been a common practice. The first attempt by the government to improve the stock was the importation of Zebu cattle from

British India in 1907. Since then the veterinary service, in co-operation with the administrative service, has applied 'gentle pressure' to encourage selective breeding. Many villages have been induced to purchase stud bulls and to castrate inferior stock, though the less docile Madoerese have sometimes slaughtered their cattle rather than castrate them. Active encouragement has been given to cattle shows and in Madoera to the local passion for cattle racing.

One of the chief activities of the Veterinary Service, which is staffed by European Veterinary surgeons with native assistants, is to combat cattle diseases. With this object regulations prohibiting the import of certain types of cattle from abroad have been introduced and supervision has been exercised over the cattle markets. Research work on animal diseases is carried out at the Institute for Veterinary Research at Buitenzorg (Java) and large quantities of vaccines and sera have been supplied to breeders. Though many cattle diseases are still prevalent, the general health of the stock has been much improved and is on the whole very good.

The chief centres of the cattle trade are Madoera and Bali, which export annually for slaughter some 60,000 and 25,000 animals respectively, as well as others for use in agriculture. Since 1913 bulls have been imported by the government into Soemba where cattle breeding has taken root, and Javanese colonists, who have settled under government supervision in the Lampoeng district of Sumatra and elsewhere, have been assisted with imported cattle.

OTHER LIVESTOCK

Horses

The chief centres for the breeding of horses (or rather ponies) are Soemba and Soembawa. From Soemba comes the well-known 'sandalwood' pony. These animals are bred on the dry grassy plateaux of central and east Soemba, where they are left in complete liberty; although the largest horse in the Netherlands Indies, the 'sandalwood' stands but little over twelve hands. Until recently every European official and planter had his team of 'sandalwoods', but their place has now been taken by the motor-car. In Soembawa there are two breeds, the true Soembawa, which is the better for draught, and the Bimanese, a taller but less sturdy horse which is used chiefly for riding. Australian and Arab horses have been imported.

Goats

Goat breeding is general in Java and the veterinary service has done much to improve the breed by importing goats from the Netherlands. Many villages in the Netherlands Indies now possess a communal stud goat.

Pigs

Pig rearing is an industry of some importance, especially in Bali and Lombok. In Java pig breeding is carried on only by the Chinese as the Javanese have the Muslim prejudice against pork. Elsewhere pig breeding is general among non-Muslim races, as among the Dyak of Borneo and the Batak in Sumatra. In Medan (Sumatra) and Buitenzorg (Java) there are pig breeding stations where the local stock is crossed with boars imported from Indo-China and Yorkshire.

HORTICULTURE

Every native house in the East Indies has its garden and in these native gardens an astonishingly large variety of fruit and vegetables is grown. Among the common fruits may be mentioned the citrus fruits—orange, lime, grapefruit and pomelo or pampelmousse—the pineapple, or ananas, the mango, the banana or pisang, the melon, pumpkin, guava, papaw or papaya, the breadfruit, custard apple, sour-sop, sweet-sop, rambutan, durian and mangosteen. A few coconut palms are grown in every native garden. Vegetables include many kinds of green vegetables and beans, as well as yams, sweet and English potatoes, and cassava. Though all these fruits and vegetables are grown mostly for home consumption or for sale in the nearest market town, the total amount of produce grown in gardens is considerable. It is estimated that in Java and Madoera gardens cover an area of 2·6 million acres. The amount of fruit produced can be estimated from the statement that in 1927, 66,414 tons of fruit were carried on the Java State Railways; at least as much again must have reached the markets in other ways, generally by lorry or carried by the cultivator himself on carrying poles.

The only horticultural product which is exported in large quantities is bananas in which there is a considerable trade with Australia. Exports amounted to 148,000 bunches in 1928. Attempts have been made with some success in recent years to develop an export of tropical fruits to the Netherlands. The cultivation of European vegetables such as cabbages for sale to Dutch residents has become

an important local industry, for instance on the Batak plateau in Sumatra, where vegetables are grown for sale in Medan.

The government has done much to encourage native horticulture by supplying the cultivator with expert advice and by establishing experimental stations for the investigation of garden pests and other problems.

DISTRIBUTION OF CROPS AND LIVESTOCK

Figures for cropped areas are available only for Java, Madoera, Bali and Lombok, as the Outer Territories in general are not surveyed for land revenue, but a useful index of the chief crops of each area is given by the statistics for agricultural exports from the various ports, the crops exported usually coming from the immediate hinterland.

JAVA AND MADOERA

The outstanding features of the agriculture of Java and Madoera are the intensive cultivation of a great variety of crops both for subsistence and export and the large area used for cultivating rice on the *sawah* system. Besides food crops tobacco, rubber and many other crops are grown. As well as native agriculture, European plantations run on capitalist lines contribute a large share to the enormous agricultural production of the island. There is little or no *ladang* cultivation, almost all the agriculture being permanent, as might be expected from the high density of the population. Except in the west, much of the land is cropped twice in the same year; in Madoera the cropped area exceeds the arable area by more than 50% and in the Semarang and Malang regions the proportion of double-cropping is nearly as high.

There is a marked difference in climate between Madoera and east Java, which have a low annual rainfall with several consecutive months of almost complete drought in the east monsoon, and west Java, which has a higher rainfall much more evenly distributed through the year. On this difference of climate depends a difference in the crops grown, some crops, e.g. tea, being better suited to the damper western climate, others such as sugar-cane, preferring the regions with a marked seasonal drought (Fig. 42).

The main rice-growing area (Fig. 65 in vol. 1 of this Handbook) forms a belt along the northern coastal plain from Batavia eastwards, broken in the Krawang-Indramajoe district and by the low teak-covered

hills of Rembang. In some parts, especially near Soerabaja, the rice belt widens towards the south, but only in the middle of the island is there any considerable stretch of rice land near the southern coast. In some districts rice gives place to other food crops; thus in

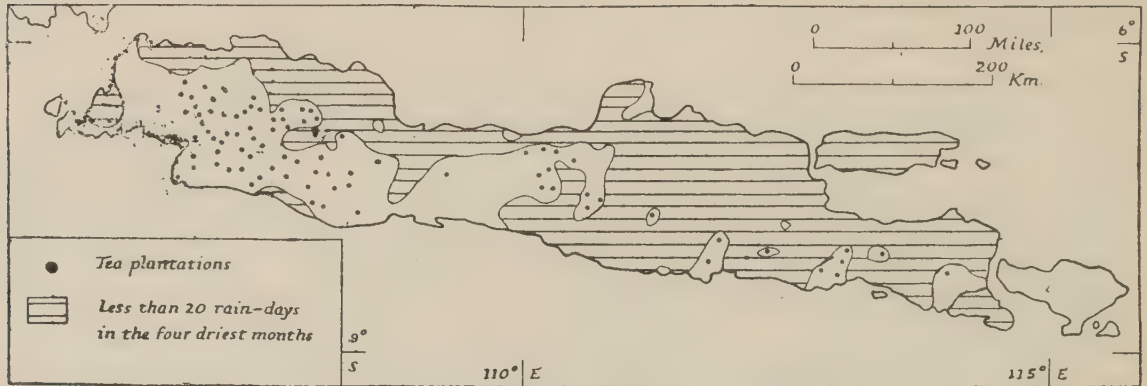


Fig. 42. The distribution of tea plantations in relation to the number of rain-days
Source: *Atlas van Tropisch Nederland*, plate 7 (Batavia, 1938).

Madoera the area under cassava is twice, and that under maize about six times, that under rice. Maize covers large areas from Semarang and Kedoe eastwards and in the Residencies of Bodjonegoro, Malang, Besoeke and Madoera is more widely grown than rice. Cassava is grown as a supplementary food crop and in some areas takes the place of rice. In the west it is little grown except in the Preanger Residency, one of the largest centres of cassava cultivation, but it is widely distributed over central and east Java and is of especial importance in the native state of Soerakarta and in the Residencies of Bodjonegoro Madioen, Kediri and Madoera. Other food crops, such as soya beans and peanuts, are widely but unevenly distributed. Little or no soya beans are grown in Madoera.

Before the economic crisis of 1929 sugar was by far the most valuable plantation crop in Java. From Cheribon eastwards it was grown on most village rice land, except where the water supply was insufficient. The distribution of the other chief plantation crops, rubber, coffee, tea and tobacco, has already been indicated.

SUMATRA AND DEPENDENCIES

In Sumatra and its dependencies the status and character of the agriculture contrasts in several respects with conditions in Java. Sumatra is much less densely populated than Java and there is not the same necessity for extracting the maximum yield from every

available acre of land. There is, moreover, much less fertile soil. Crops other than food crops are relatively more important and large areas are cultivated by primitive and inefficient native methods or still have their original covering of primeval forest.

Rubber is the only important native crop in most of Sumatra, though in the densely populated Padang Highlands native agriculture is of some commercial importance. Rice is the chief food crop, but until recently not enough was produced to meet the local demand and a large quantity was imported annually, much of it to feed the coolie population of the Oostkust estates. Since the 1930 depression, however, the coolie population has diminished, more land has been given over to rice and in Atjeh and the Lampoeng districts a surplus has been available for export. In the west of the Djambi Residency, in the adjacent Kerintji and other parts of the Westkust Residency rice is grown on the *sawah* system, but elsewhere it is chiefly grown by the 'dry' method on temporary clearings (*ladang*). Maize is the food crop second in importance to rice.

Other crops grown by the natives include rubber, tobacco, coffee, tea, kapok, coconuts and pepper. Gambir, used as a medicine and in dyeing and tanning, is cultivated, especially in the Residency of Riouw and Dependencies. Betel nuts are grown everywhere about the villages and are also cultivated for export in the north-east of Atjeh. Of all these crops rubber is by far the most important. Since its beginning about 1915, native rubber production has expanded enormously and just before the 1930 depression, Sumatra was exporting about 67,000 tons of native-grown rubber annually. Most of this came from the Djambi Residency (22,000 tons) and the Palembang Residency (16,000 tons), but some from the Residency of Riouw and Dependencies (8,000 tons) and the Oostkust Residency (14,000 tons), while rubber cultivation was beginning to spread also in the Tapanoeli Residency. Further growth of the industry was checked by the depression, until a new stimulus was given by the keen demand in 1937.

The most characteristic feature of Sumatran agriculture is the great part played in it by plantations under European management. This type of agriculture, in which much capital is invested, is chiefly concentrated in the Oostkust Residency, where it began in 1863 when the ruler of Deli granted a concession for tobacco cultivation. The soil of Deli proved exceptionally suitable for the production of high-quality wrapper-leaf and by 1937 there were forty-seven tobacco plantations in the Deli district, with a total area of 32,120

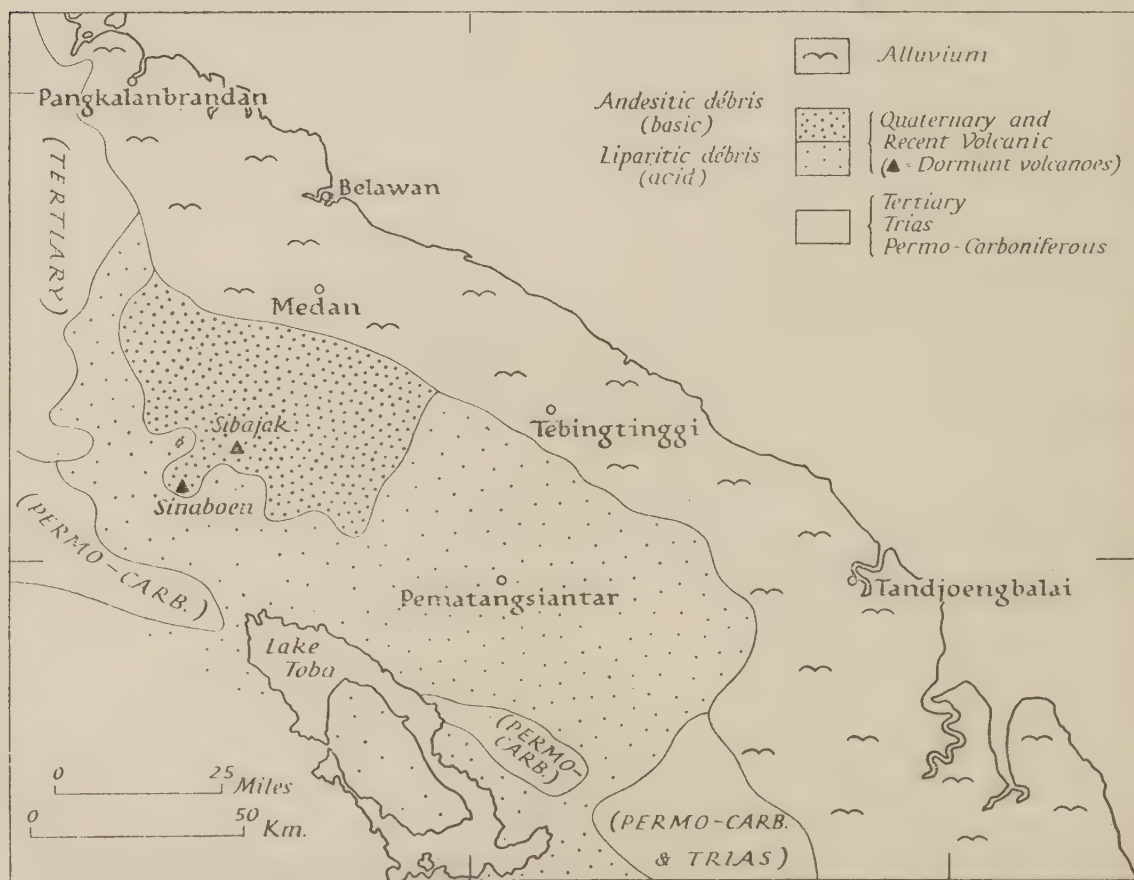


Fig. 43. The plantation area (*cultuurgebied*) of the Oostkust Residency of Sumatra
Source: *Atlas van Tropisch Nederland*, plate 12 (Batavia, 1938).

acres. The rubber estates, some of which are financed by British capital, are now far more important than the much older tobacco industry. There is a block of rubber estates north-west of the tobacco-growing district and another, much larger, stretching away to the south-east, but rubber growing, unlike most of the other plantation industries, is by no means confined to the Oostkust Residency. Other important estate products of Sumatra are palm oil (grown mainly in the same districts as rubber), tea (grown especially in the highly productive estates about Pematangsiantar), coffee and sisal.

BORNEO

In spite of its vast size, Borneo is of very little agricultural importance. The soil is much less fertile than that of Java, because of the absence of volcanoes, and the native peoples do not make good cultivators. Minerals, particularly oil, and forest products, such as rattans, wild sago and beeswax, contribute far more to the wealth of the country than do the agricultural crops.

The Dyak cultivate rice and small quantities of maize, cassava and other food crops on *ladang* in the dense forests which still cover most of the interior of the island. So inefficient are their methods, however, that not nearly enough food is produced to feed the population and much rice has to be imported. A little tobacco is grown for local consumption. The Malays who inhabit the coastal regions are in general no better cultivators than the Dyak, but in some places there are embanked rice *sawah*, especially where there is a Javanese strain in the population. Considerable quantities of pepper are produced in Poelau Laoet, on the adjacent mainland and in several other districts. Betel is grown for export in west Borneo and coconuts are of increasing commercial importance, especially around Pontianak and Bandjermasin.

In Borneo, as in Java and Sumatra, the outstanding feature of native agriculture is the rapid progress of rubber cultivation. In 1929, just before the depression, the yearly output exceeded 40,000 tons and later, after a temporary set-back, the industry responded to a renewed rise of prices.

CELEBES

Agriculture in Celebes is even more backward than in Borneo and the people have not yet taken to rubber planting on a considerable

scale. Rice and maize are cultivated on *ladang* and some maize is exported. Near the coast in some districts rice is grown in *sawah*. Coconuts are grown on a large scale, particularly in the Minahasa district, and both the nuts and copra are exported. Coffee is cultivated in some districts and kapok is produced both south of Makassar and on the island of Moena. Capitalist enterprise is unimportant.

MOLUCCAS

Though the Moluccas, because of their spices, were the first of the Netherlands Indies to become commercially important, their agricultural production to-day is insignificant. Unlike most other parts of the East Indies, the chief food plant in the Moluccas, except in the Oeliassers, is the sago palm which grows wild and is also cultivated in a haphazard fashion. Nutmegs are still widely grown, but cloves are practically confined to Amboina and the Oeliassers. The cultivation of coconuts and the preparation of copra are now the chief native occupations. The nutmeg groves, no longer of much importance, are the only form of European agricultural enterprise.

LESSER SOENDA ISLANDS

In these islands the climate becomes progressively drier from west to east and, except in Bali and Lombok, which have excellent native irrigation systems (see p. 176), lack of water limits the development of agriculture. In Bali and Lombok native agriculture is elaborately organized and reaches a high standard, higher even than in Java. In both islands there are about 222,400 acres of irrigated rice *sawah* and Bali has in addition about 120,000 acres of maize. Other crops are sweet potatoes, coffee, coconuts and tobacco. In the other islands from Soembawa to Timor the breeding of cattle and horses is an important industry, but the soil is poor and other forms of agriculture are very primitive. In general maize is the chief food crop, but rice is grown in some parts of Soemba and Soembawa. Along the coasts the people grow coconuts and prepare copra.

AGRICULTURAL POLICY

THE CULTURE SYSTEM

Though large-scale capitalist enterprise plays a very important part in the agriculture of the Netherlands Indies, especially in Java and

Sumatra, in recent years the agricultural policy of the government has aimed primarily at the assistance and improvement of native cultivation and the protection of the rights of the economically weak native against encroachment. To this end an elaborate system of laws and regulations has been built up, which is largely responsible for the comparatively favourable economic situation of the native people. In order to understand the present organization of agriculture in the Netherlands Indies, which involves a careful balancing of the claims of the native cultivator and the European planter, it is necessary to understand the most important event in its past history, the episode of the Culture System (*Cultuurstelsel*).

This system was the work of Governor-General Van den Bosch, who took office in 1830. Previously, under the Dutch East India Company, attempts, mostly ill-judged, had been made to encourage and control the output of spices, sugar and coffee, but an export of agricultural products on a large scale had not developed. The main object of the Culture System was that the Indies should bring a profit and not a loss to the home government; its essential feature was that the natives were compelled to give a proportion of their land and labour, without payment, for the cultivation under European supervision of export crops such as sugar, coffee and indigo. The produce was sold in the Netherlands for the benefit of the government. The system was only applied in Java and at its height it affected only 5% of the cultivated area. It soon achieved its purpose of providing the home government with a large revenue surplus and to some extent it promoted the economic development of the natives, disciplining them in the methods of intensive agriculture and leading to a large increase in the population. It became repugnant to the liberal spirit of the later nineteenth century and soon began to lead to evils and abuses; it also came into collision with village customs governing land tenure. The increasing need of the home government for money, together with the rapacity of officials, both European and native, led to such heavy demands on the land and time of the cultivator that he had little opportunity of providing for his own subsistence.

LATER DEVELOPMENTS

The first step towards reform came in 1848 and the Agrarian Law of 1870 practically abolished the Culture System, though its effects are still evident at the present day. The Culture System had the merit

of demonstrating that under European supervision crops could be profitably grown for export and its success stimulated private enterprise to enter the field. During the last quarter of the nineteenth century many European planters built up huge fortunes on the foundations Van den Bosch had laid. At first they concentrated on crops which had been grown successfully by the government, especially sugar, coffee and indigo, though some experimented with tea and tobacco. Towards the end of the century the catastrophic failures of the coffee plantations and the spread of sugar-cane diseases combined with the bounty-fed competition of European beet sugar, compelled the planters to try other crops. A new stimulus to variety in production came at the beginning of the present century, when synthetic indigo ousted the natural product, and, about the same time, the introduction of Para rubber provided a new opening for enterprise.

The difficulties of the planters at the turn of the century led to the development of scientific research and to great improvements in their marketing organization. In their efforts to introduce scientific methods into tropical agriculture the planters soon won the active co-operation of the government. The Agricultural Department, however, since it was first founded in 1905, has interested itself primarily in native agriculture and with its help the more enterprising natives have profited by the example of the planters and taken to the cultivation of export crops, especially rubber. Moreover the demand of the sugar planters for water and the need of a rapidly growing population for rice have stimulated a great development of irrigation.

This combination of European and native agriculture, with the strong support of the government and the willingness to apply the results of scientific research, have been responsible for placing Java in the forefront of tropical countries as a centre of prosperous and varied agriculture. In the Outer Provinces natural conditions have been less favourable. Soil and climate are not so suitable. The population is comparatively scanty and the natives are less civilized; they have, moreover, never had the stern discipline of the Culture System. Thus, as a whole, the Outer Provinces are far behind Java agriculturally. Certain regions, however, are well suited for growing such crops as rubber and copra which are largely native-grown and the exports of these from the Outer Provinces in recent years have been greater than those of Java. Some parts of the Outer Provinces, too, have proved specially suited for certain plantation crops, for instance the Deli district of Sumatra for tobacco.

STATE AID TO AGRICULTURE

The government of the Netherlands Indies has built up an elaborate organization for helping both native and European agriculture. It has developed and organized irrigation, founded and maintained scientific research institutions and provided agricultural intelligence and education services by which the results of research can be made available. Further, the State has helped agriculture on the social and economic side by encouraging co-operation and by the provision of credit.

The attempt to introduce scientific methods into agriculture in Java may be said to date from the financial crisis of 1884 when widespread failures led to the concentration of control over the plantations by strong financial institutions. These insisted on a common policy for production and the sugar factories combined to establish experimental stations. The further development of the organization of the sugar industry has already been indicated on p. 310. Meanwhile planters growing other crops had combined into strong organizations dealing with tea, cinchona, coffee and cocoa, and rubber, each with its own experimental station. These were afterwards amalgamated into the General Agricultural Syndicate, which is a counterpart of the single large organization controlling the sugar industry. Similar associations have been formed in the Outer Provinces.

The three great planters' organizations, the Syndicate of Sugar Producers, the General Agricultural Syndicate and the Union of Tobacco Planters are linked up with the State, which accepts them as the official representatives of their respective interests. They advise the government, but have control over their own internal affairs and their experimental stations. These and other industrial and commercial interests are represented on the general Federation of Indian Industry and Commerce (*Indische Ondernemersbond*). Through this federation the government keeps in touch with all aspects of European enterprise and can render assistance where it is needed.

Alongside this organization, which is mainly private, is another mainly official. In 1904 Treub, the Director of the Buitenzorg Botanical Gardens, suggested that the various agricultural activities of the government should be brought under a single control. This suggestion took effect in the following year with the foundation of a Department of Agriculture. The growth of a wider conception of State functions during the present century led in 1928 to the creation of a Council of Natural Science as the coping stone of a comprehensive organization for scientific research. The numerous research

institutions forming part of this organization are grouped into two sections, one concerned with pure science, the other with applied. The pure science institutions are under the general supervision of the Director of the Government Botanical Gardens at Buitenzorg and include, besides the gardens ('s *Lands Plantentuin*) themselves, several other gardens, museums and laboratories occupied with problems of botany, fisheries and general zoology. Several of these institutions, notably the Buitenzorg gardens and the mountain garden at Tjibodas, have gained a world-wide reputation for the scientific work done there by their own staff and by visiting scientists from abroad. The applied institutions work for the benefit of native agriculture and also supplement the institutions which the European agricultural organizations have provided for themselves. The applied institutions were amalgamated in 1918 as the General Experimental Station for Agricultural Industry, which has a host of subsidiary institutions dealing with geology, plant diseases and many other subjects connected with agriculture.

The native cultivator needs State help in different ways from the European planter. The native is a good cultivator on his own lines, which are sounder than some western critics recognize, but he is ignorant of the principles of scientific agriculture and of economic conditions in the world markets; he also lacks capital. In all these respects he is at a disadvantage compared with the European planter and can greatly benefit from State assistance.

The Department of Agriculture when it was first formed in 1905 was intended primarily 'to devise methods for the permanent improvement of native agriculture'. In 1911 this department was merged in the newly-formed Department of Agriculture, Industry and Commerce, which in 1934 was reorganized as the Department of Economic Affairs. The work of the agricultural branch of this department is divided into five sections, dealing respectively with agriculture, horticulture, fisheries, agricultural instruction and agricultural economy. The largest of these sections is known as the Agricultural Information Service, which is organized regionally and in the Outer Provinces works under the Provincial Council. In each large administrative region there is a European agricultural expert (*landbouwwconsulent*) with a large staff of trained native assistants who keep in close touch with the native civil service and the people.

In addition to supplying technical advice, the government provides agricultural education. The highest agricultural educational institution is the Secondary Agricultural School at Buitenzorg, which is

open to all sections of the population and provides secondary education in agriculture and forestry. Besides this there are two Culture Schools in Java, which provide a training for subordinate positions on estates and for government posts as agricultural and forest supervisors, and a number of Agricultural Industrial Schools run on native lines in which practical instruction is the main feature. In some parts of Java courses are also given in the villages by village or *desa* teachers.

Agricultural Credit

The government scheme for helping the native by giving him access to credit is known as the 'popular credit' (*volkscrediet*) movement. It had long been the practice for villages to have a communal granary to store food and seed for the coming year. This formed the basis for the village paddy banks which lend out seed rice to be repaid at harvest. In other villages similar banks were organized dealing in cash instead of rice. These needed working capital which, it was thought, could be obtained from local institutions of another type. For some years European officials had encouraged their native subordinates to form mutual benefit societies, the *priajibanken* or banks for officials. As part of the popular credit movement the *priajibanken* were reorganized on a new footing as 'subdivisional banks'. The original scheme was that the subdivisional banks, village banks and paddy banks should develop as parts of a single co-operative organization. This project confounded two distinct objects, the provision of credit and the encouragement of co-operation and it was never completely realized. Each small bank remained a separate unit and was too weak financially to raise or lend money on economic terms. In 1913 the Central Cash Bureau was constituted to overcome this difficulty and ultimately the movement towards centralization led to the creation in 1933 of the General Popular Credit Bank (*Algemeenvolkscredietbank*).

The fundamental soundness of the popular credit movement was demonstrated by the success with which it withstood the great depression of the thirties. How far it has succeeded in its object of helping the cultivator is uncertain. The loans from the subdivisional banks go largely to traders and even village banks finance petty trade as well as cultivation. Some critics suggest that the cultivators borrow as much as before from Chinese and other private money-lenders and that the popular credit movement has merely enabled them to borrow from the banks as well as from outside. Others hold that the banks

are useful to traders rather than to cultivators. These criticisms are probably exaggerated and there seems little doubt that the popular credit movement has been of great help to all classes of the people.

When the State credit system had been built up the government attempted to tackle the more difficult problem of encouraging co-operation. The village and other native institutions rest firmly on a communal basis, but it is another matter to induce villagers as individuals to co-operate on western lines. The initiative here came largely from the nationalist movement, which has encouraged the formation of 'wild' or unofficial co-operative societies. It has also led to the creation of the National Bank of Indonesia on joint stock principles, to finance native agriculture. The government has responded to the new movement by promoting the formation of co-operative societies under official supervision and by 1937 there were 410 such societies registered, of which 323 were credit societies, the remainder being for production or for sales or societies of consumers.

LAND TENURE

Non-native Lands

Once the protection of native rights had become the avowed policy of the government, it became a difficult problem to devise means for satisfying the legitimate demands for land of large-scale agricultural industry. The first satisfactory solution was found in the Agrarian Law of 1870 which provided that all land to which no one could prove a right of ownership should be deemed to belong to the government and could therefore be let on long lease to suitable applicants. This system originally applied only to Java and Madoera, but it was later extended to the directly governed Outer Provinces and, in the slightly modified form of the 'Agricultural Concession', to the self-governing territories as well. The long-lease system had two advantages over the previously general custom of hiring land on short leases from the natives; the longer tenure gave security for development and the rights obtained could be used as a security for loans. In densely populated areas where there was no unclaimed land, the hiring of land from the natives continued to be of great importance and in the self-governing principalities of Java (*Vorstenlanden*) a system of hiring land from the native rulers is in force.

At the present time land cultivated by others than the natives themselves can thus be held under any one of the following titles: by heritable long lease from the government (*erfpacht*), by hiring on

short leases from the native inhabitants, in the *Vorstenlanden* by concessions from the native rulers, and by 'agricultural concession' (*landbouw-concessie*) in the Outer Provinces. In addition, there are, particularly in the Batavia district, large areas of land in private ownership (*particuliere landerijen*) the titles to which in many cases date from the time of Raffles; the government has also let out small areas as gardens and small holdings, mainly to Eurasians and indigent Europeans, while, finally, a number of estates are still owned directly by the government and cultivated on its behalf. The areas held in these different ways are given in the following table:

Legal status of non-native agricultural land, 1937

Status of land	Area in acres	
	Java and Madoera	Outer Provinces
Long lease* (<i>erfpacht</i>)	1,447,670	1,485,100
Hired on short leases from inhabitants	232,280	—
Estate land in native states (<i>Vorstenlanden</i>)*	148,260	
Agricultural concessions		2,629,150
Private lands (<i>particuliere landerijen</i>)	1,205,870	
Long lease from Government for small holdings, etc.		7,400
Government estates	45,697	17,985

* The areas given are those of land held or leased. The area actually planted with plantation crops is for various reasons considerably less.

Source: *Indisch Verslag*, 1938, vol. II, pp. 242-4 (Batavia, 1938).

The *erfpacht* or long-lease system of letting land to European planters has worked well and little change has been made in the original form of the contract, though during the present century greater attention has been paid to native interests. Before a lease is granted opportunity is given to the villagers to enter objections and the Irrigation and Forestry Departments are consulted. The holder is free to cultivate any crop he chooses except opium, which is a government monopoly. He is subject to the ordinary taxes and pays a small rent (*canon*). A special permit is needed for the use of irrigation water. Provided the lessee keeps to the terms of his lease, he may mortgage his interests or transfer them to others. In the Outer Provinces much larger areas are leased and the rent paid is lower.

The chief form of agricultural enterprise to which the long-lease system was inapplicable was the growing of sugar-cane on village

land and for this purpose the hiring of land from the inhabitants on short leases is still a common practice. In order to prevent abuses a contract must be drawn up by a government official and confirmed by a civil servant. Village rice fields can be hired in two ways: either for $3\frac{1}{2}$ years at a low rent or for $21\frac{1}{2}$ years at a rent above a minimum fixed by the government. In the latter case the land must be temporarily returned to the cultivator during a certain number of west monsoons. Which method of hiring is preferred depends on the goodwill existing between the planters and the villagers; where relations are good the planter prefers to pay a small rent but have little legal security of tenure, where they are not he is willing to pay more in return for greater security. For 'dry' fields the maximum hire period is usually twelve years.

In the native states all land was formerly regarded as belonging to the native ruler and the villagers were obliged to pay him a rent as well as giving him a certain proportion of their labour. When it became the custom for the ruler to grant concessions to European planters the latter used to acquire a claim not only to the land but also to the unpaid services of the cultivators. On this system of forced labour a great sugar- and tobacco-growing industry was built up, but the condition of the cultivators was miserable and the need for reform soon became pressing. In 1918 a new regulation was introduced which guaranteed the planters possession of their land for fifty years, on condition that they would make agreements with the cultivators similar to those in force in other parts of Java.

Land held by Europeans in private ownership is diminishing in extent. During the nineteenth century the treatment of the cultivators on privately-owned estates was bad and led to several commissions of enquiry with little result. Towards the end of the century many of these estates passed into Chinese hands and in 1906 it was suggested that they should be acquired by the State in order to lessen Chinese influence and promote the welfare of the natives. Later some estates were bought by British and French capitalists, but the government did not in fact acquire any of them till 1910. In the following year provision was made for transferring them all to the government at an estimated cost of £ 400 million. By 1931, 1,669,700 acres had been acquired, leaving 1,208,300 acres still in private ownership. The economic depression compelled the government to suspend further acquisition, but in 1935 the Java Private Lands Company was formed under government auspices to buy up the remaining estates and develop them with special regard to native

welfare. Of the land still remaining in private hands, only 111,900 acres now carry plantation crops, the other 41,500 acres being occupied by native cultivators.

Plantations directly owned by the government number fourteen in Java and two in the Outer Provinces. The government does not now, as in the days of the Culture System, aim at profit and employ compulsory labour; normal wages are paid and the object is the improvement of production. The oldest of these government plantations is a cinchona plantation established in 1854 and the others originated in experiments in rubber planting begun by the Forestry Department in 1900 and afterwards transferred to the Agricultural Department. In 1937 all the government estates were amalgamated under a single director and comprised eleven estates growing mainly rubber, one each growing rubber and gutta percha, rubber and oil palms, coffee, tea and cinchona and one enterprise in the Gajo Lands (Sumatra) for obtaining resin and turpentine. The total area of these plantations in Java was 45,697 acres, in the Outer Provinces 17,985 acres.

Native Lands

In the East Indian islands there is a long-standing tradition that the community, tribal or territorial, enjoys a right of disposal over the land within its sphere of influence. Recently, however, there has been a tendency for the individual to remain in permanent hereditary possession of his land, with a title not very different in practice from the western right of private property.

After the establishment of the Culture System in Java the increasing development of export crops for which large-scale cultivation was necessary led the government to encourage the idea of the communal ownership of land, which had the further advantage of strengthening the authority of Regents and village headmen through whom the government exercised its control. The natives, moreover, were glad to avoid the burdens attaching to the individual possession of land. Thus, particularly in the sugar- and indigo-growing districts of east Java, the system of communal tenure with a periodical redistribution of the land became firmly established.

Towards the end of last century the planters, finding that the communal system of land tenure hampered their efforts to acquire land, urged that individual rights of property on western lines should be introduced. The government has resisted this development as harmful to native interests, but the trend towards individual instead

of communal occupancy has nevertheless made considerable headway. The proportion of villages in which all land is held by individuals rose from 18·5% in 1882 to 38·7% in 1927. Even in villages where communal ownership still prevails there has been a tendency for individuals to hold their share for life and for the periodical redistribution of land to take place at longer and longer intervals. As late as 1927, however, over half the villages in Soerabaja Residency redistributed their land every year.

Outside Java every form of native land tenure is found, varying from the common right of a primitive community over its hunting grounds to the ownership of large and valuable rubber plantations by individual villagers. Over much of the Outer Provinces shifting cultivation in the jungle is practised and possession is impermanent because cultivation is impermanent.

The individual holdings of native cultivators in the Netherlands Indies are usually small. Thus, in Java the average holding per land-owner, including both 'wet' and 'dry' land, was returned as 3·95 acres in 1922, 2·45 in 1930 and 2·20 in 1937; these figures, however, are not strictly accurate, as cultivators with several holdings may have been reckoned more than once. In east Java, where individual possession prevails, there would seem to be a tendency towards aggrandisement and casual references to land-grabbing suggest that in some villages the land is passing into the hands of village money-lenders. In general the land is held in tiny shares by cultivators who may be in debt, but have not been compelled, or are not permitted, to make over their land to non-agriculturalists.

FISHERIES

The fisheries of the Netherlands Indies are chiefly important because they provide the large and increasing population with one of its staple foods; together with rice, fish is one of the main items in the diet of the Javanese and other native peoples of the archipelago and is their chief source of protein.

SEA FISHERIES

Both deep-sea and shore fishing are important occupations all along the coasts of the islands. The shore fishermen usually carry on fishing as an occupation subsidiary to agriculture, but the deep-sea fishermen usually have no other occupation. As well as the native and Chinese

fishermen, Japanese fishermen, many of whom have been suspected of being spies, have frequented both the coastal and the deep-sea fishing grounds since about 1924.

Along the north coast of Java and Madoera and in the more densely populated parts of the Outer Provinces a considerable native trade in fish has grown up. In the years before financial disaster overtook the Javanese sugar plantations native merchants sent whole wagon loads of dried fish inland for sale to the coolies on the estates. In this trade producer and consumer, as well as the merchants and the middlemen, are Javanese, and it is clear that it is the economic environment rather than any defect of character which has prevented the native from taking a larger part in commercial developments.

Fishing methods

Fishing methods are diverse and include lining, seining, gill netting, stake nets, traps and dip nets. Lining with hand-lines is common everywhere, but information about it is scanty except for Java. Here the *majang proas* use several kinds of long-line and hand-lines on the south coast. An anchored form of long-line known as the *panching raweh* is much used. Kite angling for garfish from a small canoe is a common method of fishing in the Moluccas and may also be seen in the islands lying to the north of Batavia (Fig. 44). Native fishing for



Fig. 44. Angling with a kite (*Manching lajarg*)

This form of fishing is carried on mainly in the Moluccas, but may be seen almost anywhere in the Netherlands Indies.

Drawn from a photograph.

bonito consists of trailing a hook, baited with a feather, from small sailing boats or outriggers. Seining, especially with beach seines, is pursued from suitable beaches on all the islands. The net is taken out in a small outrigger or rowing boat and shot in a semi-circle and then hauled in. The *majang proa* operates a seine with a deep bag in open sea in conjunction with fish decoys known as *roempon* or *tendak*. The decoy consists of a long rope anchored to the sea bed and buoyed with a bamboo float at the surface. Coconut leaves are fixed to the rope at intervals. Many decoys are set days ahead and fish of the herring and mackerel families and related varieties tend to collect around a floating object like this. The fishing boat returns after several days and quickly shoots the seine around the lure which is then hoisted up and the net hauled. A daily haul from each decoy is the normal procedure. The catch consists mainly of *lajang* (*Decapterus* sp.) Fishing areas on the north Java coast are between 20 and 50 miles out, but the smaller *majang proas* may operate closer inshore. Gill nets and drift nets comparable to those of European waters are known as *jaring*. These are used mainly at night or by day in the muddy waters of estuaries.

Fish-traps are of various types and include stakes, bow nets, fykes and funnel nets. In north Java large constructions on the fyke principle, known as *sero*, are used; these consist of several chambers connected by narrow entrances. A *sero* is always built facing a beach and a palisade of bamboo from the shore to the mouth of the trap guides the fish into it. Each trap is emptied daily, the catch consisting mainly of small coastal fish and shrimps. The *jermal*, a stake net with two long rows of stakes leading to an enclosure with a net, is much used in Sumatra in the estuaries of the big rivers. The big fishery at Bagansiapiapi depends largely on this gear for its catches. It appears that the disadvantage of the *jermal* is that it is costly to erect and, when tidal conditions alter in an estuary, it cannot be moved. For this reason the *jermal* is being supplanted by a smaller, more portable engine known as the *si stji*.

The *boeboe*, a Malay wicker basket trap, is much used in Java for catching the Indian Yellow-tail (*ikor koening*) on reefs (Plate 46).

On various islands large fishing towers may be seen in shallow water. These are used in conjunction with a large form of the Chinese dip-net (Plate 47).

The jermal

A *jermal* is composed of two rows of palm stems driven into the



Plate 46. Fishing with a small hand-operated shrimp net, Java



Plate 47. Fishing with a staked dip net, Celebes

The fishermen watch for the passage of fish over the net from the trestle tower.



Plate 48. Outrigger canoe, Bali

The connective is the type illustrated in Fig. 45, No. 11.



Plate 49. Fish market, Batavia

bottom to form a big V. The median axis of this V is placed facing the main direction of the ebb-flow of the tide. The 'wings', which may have a length of over 500 yds., converge to a rectangular wooden paling in which a fine-meshed net made of rattan is suspended. The rectangular net is hung so that the edge at the front of the trap is on the bottom, while the edge furthest away from the opening is above water. When fishing is in progress during an ebb-flow the force of the current drives the fish on to the net whence they are removed with a scoop net. In the more elaborate constructions of this kind the slope and position of the net is controlled by hand-manipulated winches. Sometimes the posterior end of the net is bent to form a tunnel leading into a bag-shaped net where the fish are trapped. The bag is hauled up and emptied every 20-30 minutes during a catching period of 4-5 hours.

A big sea-*jermal* costs about thirty thousand guilders to build and several thousand guilders for repairs each year. Apart from the initial cost the *jermal* suffers from the disadvantage that once erected it cannot be moved. In the Soengai Rokan the strength of a current or the direction of it may change in a few years with disastrous results on the catches. Between 1929 and 1933 such a change occurred in estuarine conditions resulting in the abandonment of the *jermal* by many fishermen.

The Si Stji

The decline in the use of the *jermal* as a fishing trap caused many fishermen to adopt a similar, smaller, but transportable trap, the *si stji*. This is constructed on similar lines to the *jermal* but instead of having 'wings' consisting of palm stalks a fine-meshed net, supported by stakes, is used for guiding the fish towards the trap. Several of these nets are placed in a row side by side, each net having a length of 50-60 ft. between the ends of the wings. Together, they catch more than a *jermal* with the same width between the wings.

The *si stji* is much cheaper than the *jermal*. About ten of these nets may belong to one owner, their total cost being f 300-350.

Fishing Craft

Fishing craft throughout the Netherlands Indies are small craft of less than 50 ft. in length, most of the boats being small outriggers of 15-25 ft. in length. Minor trading and fishing outriggers are very much alike and frequently the same kind of boat is used for both

purposes. As a rule, however, the fishing craft are more rudely fashioned with little or none of the ornamentation seen in most of the trading outriggers. There is only one distinct kind of deep-sea fishing boat in the whole area. This is the Javanese *majang proa*, a vessel employed mainly for seining in the open sea up to fifty miles from the shore. The *majang proa* may reach a length of 45 ft. and is usually manned by about twenty men. It is to be seen on all Java coasts except the east and north-east coasts. All other fishing craft are double outriggers, single outriggers being only found in a few localities. These have either simple dugout hulls or hulls built up from a dugout keel.

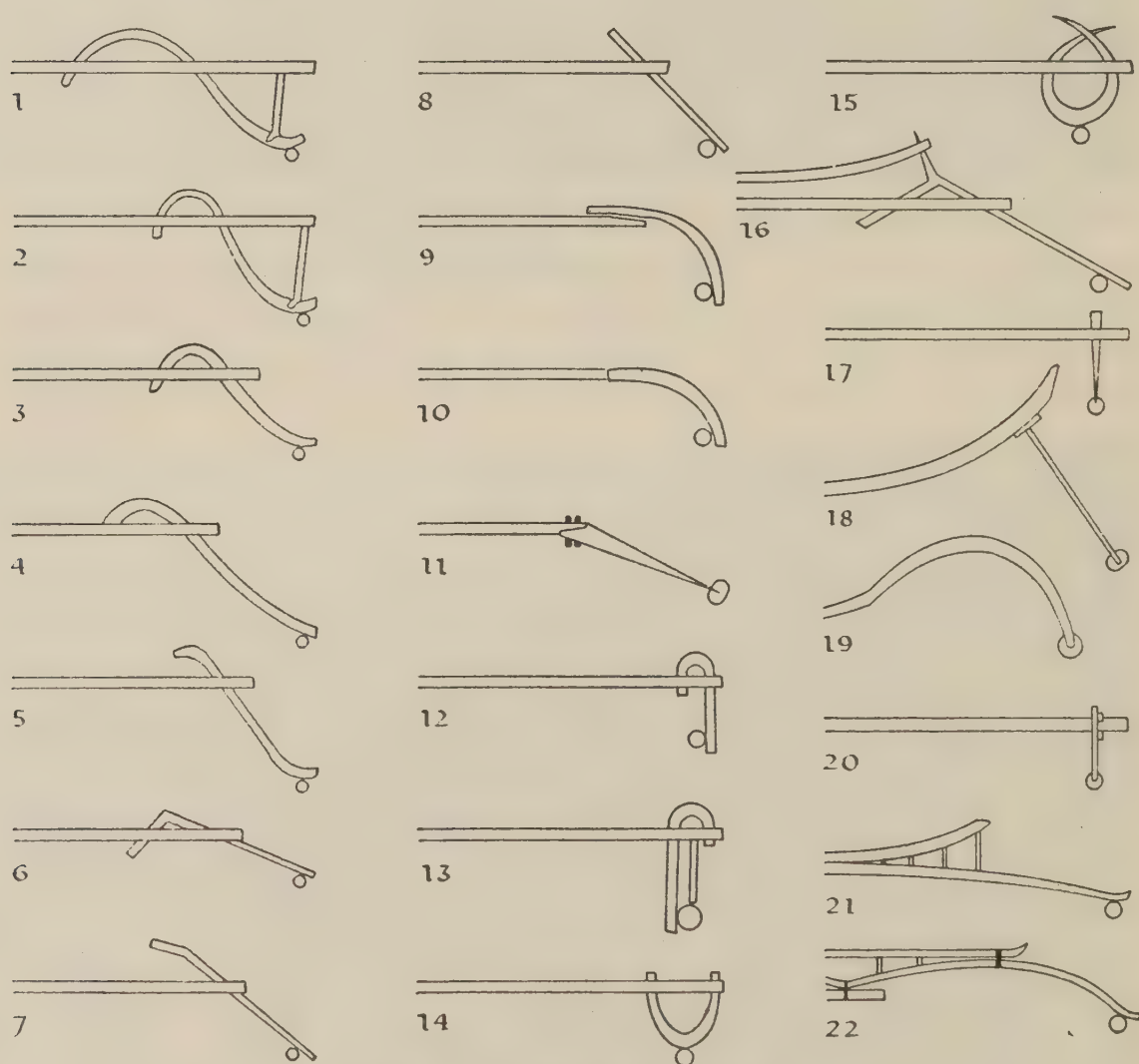


Fig. 45. Outrigger connectives

1, 2, 3. Minahasa, Celebes; 4. Lombok; 5. North Celebes, etc.; 6. Amboina; 7. Northern Moluccas; 8. Waigeo; 9. Wijnkoops bay (Java), Flores, Timor; 10. South-east Celebes; 11. Bali, Lombok and east Java; 12 and 13. South-east Celebes; 14. Moluccas; 15. Amboina, Banda, Ceram; 16. Tanimbar; 17. New Guinea; 18 and 19. East Java; 20. North Java; 21. Soeloe; 22. South Celebes.

There is a great variety in the outriggers from different areas and several features are useful in distinguishing the craft of one area from those of another. Chief of these is the way in which the outrigger boom is attached to the float (Fig. 45). In the Moluccas the favourite method of attachment is the U-shaped connective, while in Java and Bali several distinct kinds of connective are found. The distribution of the commoner forms of attachment follow broadly defined areas,

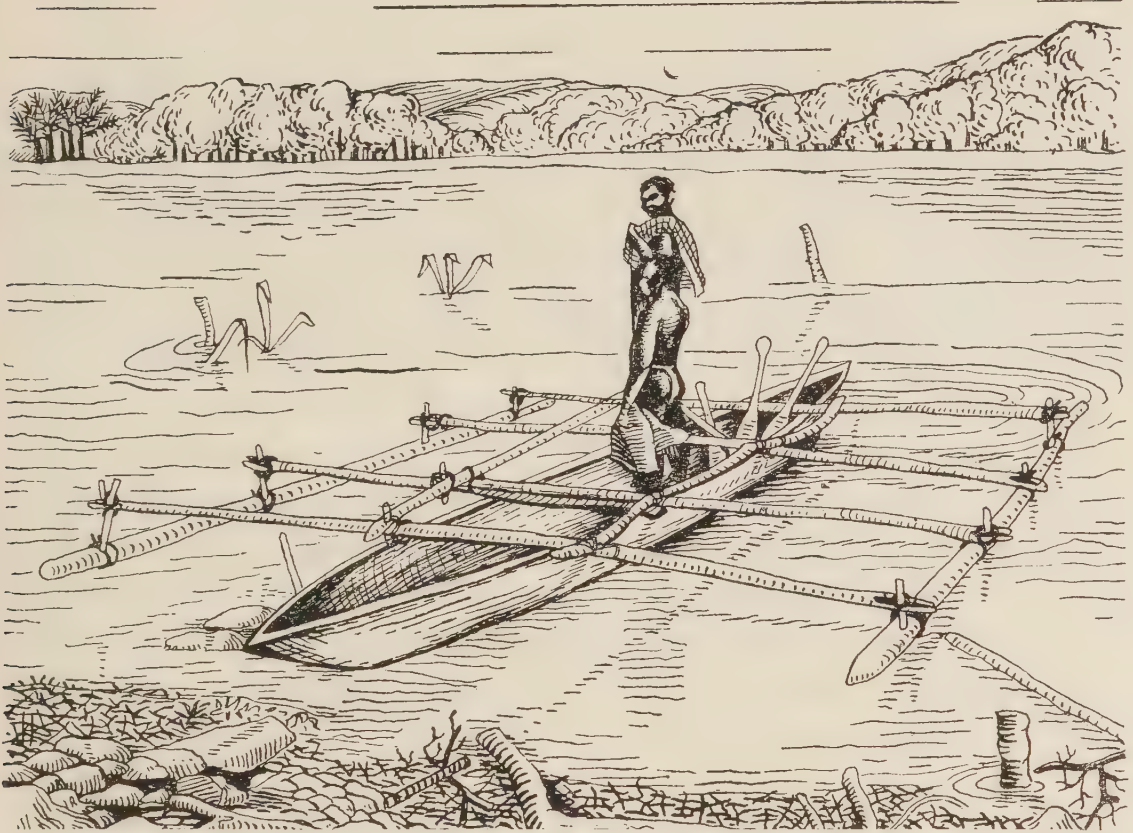


Fig. 46. Small outrigger, north-west New Guinea (drawn from a photograph.)

The connective is the type illustrated in Fig. 45, no. 17.

though here and there islands are found where several forms of connective are seen. The rarer or more specialized kinds of connectives are found only in well defined localities such as an island or a group of islands. This is especially true of eastern Java and Bali. The form of the bow and stern vary in different groups of islands and even in different parts of the same island. The bifid bow is especially characteristic of Java, Madoera and Bali craft, but may also be seen at other places such as the north-western point of New Guinea and in the Soeloe archipelago. The number of outrigger booms is usually two, but on

the fringe of the area to the east and to the north more than two booms are the rule rather than the exception. The primitive tripod mast although disappearing rapidly still survives in the Moluccas and Lesser Soenda islands and may occasionally be seen in Celebes. The two characteristic sails are the Malayan lugsail with a boom, and a triangular (modified lateen) sail. The latter is characteristic of eastern Java, Madoera and Bali, while the former is distributed throughout the area. Sometimes this lugsail is almost square in shape and sometimes enormously elongated in a horizontal direction to form an oblong or 'sompot' sail.

Some of the larger fishing canoes have a cabin built amidships. This is usually built outboard over the booms on either side of the hull. In this way quite a large cabin can be built on a small inexpensive hull and is probably partly the reason why outrigger craft have survived so long, especially in coastal trading. The cabin is of light construction being usually built of bamboo spars with a roof of *atap* leaves over which strips of bamboo are laid at spaced intervals.

Other Sea Products

Other sea products are pearls and mother-of-pearl, which are obtained mainly at Dobo and elsewhere in the Aroe islands, various kinds of shell-fish, turtles, and in the east of the archipelago, *trepan*, a food much appreciated by the Chinese. Agar-agar is obtained from seaweeds in the western part of the islands. Makassar is the chief market for such products.

The Chinese Fishery at Bagansiapiapi

This fishery is the most important in Sumatra and is carried on at Bagansiapiapi and the smaller settlements of Seneboei and Paipahan, all situated at the mouth of the Soengai Rokan. The fishing is in the hands of Chinese who settled here during the last sixty years and adopted the Malayan *jermal* for exploiting the fishery. In 1928 the total value of fish products, consisting of fish, shrimps and *trassi*, amounted to more than seven million guilders.

In 1929 the whole sea in front of the Rokan mouth was covered with *jermal* (fixed fish traps described above) which made navigation difficult. The tides are very powerful giving rise to strong currents which are particularly suitable for *jermal* fishing; drift nets are used outside the *jermal* area and lines may be used anywhere in the estuary. The local population is too small to consume all the fish caught, so

that in this and a few other places the salting and drying of fish and the production of products such as *trassi* is becoming important. Fish and *trassi* are consumed for the greater part in the Netherlands Indies (especially Java and the plantation area of Sumatra) and shrimps are mostly sold to Singapore. The total production of dried fish in 1939, however, was insufficient to meet the demand and considerable quantities were imported from Siam and other places.

FISH-PONDS

On the muddy parts of the north coast of Java, especially near the large towns of Batavia, Semarang and Soerabaja, a large industry has grown up of fattening fish in artificial salt or brackish water ponds known as *tambak*. This industry, like the fishing at Bagansiapiapi, is mainly a Chinese concern. The ponds are usually constructed on the sites of former mangrove swamps and the fish raised is chiefly the *bandeng* (*Chanos chanos*), also known as the milk fish, white mullet or (in Australia) salmon-herring. The fish lays its eggs in the sea between April and July. The fishermen anchor bundles of leaves in the sea and the young fish collect in the shelter thus provided; they are then caught in hand nets and carried in jars or tubs to the fish ponds. Here they feed on algae and water weeds and fatten remarkably fast. A year-old fish is about twenty inches long and at this age about a third of the fish have reached a marketable size.

FRESHWATER FISHERIES

The rivers and freshwater lakes of the Netherlands Indies abound in fish and though many of them are bony and not very palatable, the freshwater fisheries are of considerable economic importance. In the remote and less civilized areas the natives often catch fish by means of *tuba*, the root of the *Derris* creeper, and other fish poisons which kill or stupefy the fish but do not make them unfit to eat. Fish are often reared in artificial tanks or ponds, especially in the Preanger Residency in western Java; in some districts every compound has a tank where carp or other fish are bred. Fish are also cultivated in large numbers in the flooded rice fields, either between seed-time and harvest or between two crops. Some of the inland fisheries are thus productive all the year round, while others are seasonal. It is estimated that the inland fishing waters cover an area of over 100,000 acres, but the smaller ponds escape survey, so this is no more than a rough figure. The gross annual yield is about 65,000

tons and is worth about f 30 million. A good fish-pond may sell for as much as f 4,000 an acre.

Formerly these fish-ponds were discouraged as it was feared that they would lead to the spread of malaria, but now they are encouraged as it is realized that the fish devour the mosquito larvae.

A labyrinthic fish, the *gourami* or *guaramee* (*Osphromenus olfax*) is one of the chief fish raised in the freshwater ponds and its flesh is much esteemed. The productivity of the ponds is often increased by allowing the effluents of latrines to flow into them.

ADMINISTRATION AND RESEARCH

The government has taken a considerable interest in the native fishing industry, both sea and freshwater, and has done much to promote its prosperity. A division of the Department of Economic Affairs is concerned with sea fisheries and is run on commercial lines. Even during the depression of 1930 it managed to pay its way with such success that, although staff and wages were being cut down in all other departments, it was allowed to recruit new assistants from Europe at the height of the depression. The government has also established a Laboratory for Marine Investigations at Buitenzorg, where research is carried out on the mode of life of the chief economic fishes. The marine aquarium attached to this laboratory is open to the public and is one of the recognized 'sights' of the town.

Inland fisheries are under the supervision of the Agricultural Intelligence and Research Service, which has attached to its staff experts who act as advisers and carry out research into problems connected with the fish-ponds.

There is no tax on the sea fishing industry, but the catch has to pay market dues when sold at the port of landing. Some revenue is derived from the inland fisheries, as they are assessed for land revenue, being reckoned, rather incongruously, as 'dry land'.

BIBLIOGRAPHICAL NOTE

1. A number of valuable articles, including a mass of statistical data, on the scientific aspects of agriculture in the Netherlands Indies, are contained in *Proceedings of the Fourth Pacific Science Congress, Java, 1929*, vol. IV (Batavia-Bandoeng, 1930).
2. A useful survey of the pre-war position and post-war prospects of agricultural exports from the Netherlands Indies is given in P. Honig, 'The Future of Export Agriculture in the Netherlands East Indies' *Far Eastern Survey*, Feb. 22, 1943, pp. 38-43.
3. On the fishing industry see H. C. Delsman, 'Fishing and Fish-culture in the Netherlands Indies' *Bulletin of the Colonial Institute of Amsterdam*, vol. II, No. 2 (Amsterdam, 1939). For an account of native craft see A. C. Haddon, 'The Outriggers of Indonesian Canoes' *Journal of the Royal Anthropological Institute*, vol. I, pp. 69-132 (London, 1920).

Chapter VII

FORESTRY

Extent and Character of the Forests: Economic Value of the Forests:
Forest Policy and Administration: Bibliographical Note

EXTENT AND CHARACTER OF THE FORESTS

More than half the total area of the Netherlands Indies is forest covered. Large tracts in Borneo, Sumatra, Celebes and New Guinea still bear *primaeval* jungle, though there has been much felling and in all the islands there are large areas where the forest has given place to cultivation, grassland or wildernesses of scrub and ferns. It is estimated that in the Outer Provinces no less than 296·5 million acres (68% of the whole area) are forested, while forests still occupy 7·4 million acres or about a quarter of the surface even in densely populated and intensively cultivated Java. Only the Lesser Soenda islands, with their low rainfall and dry east monsoon, are poorly wooded. The percentage of forest in the different islands varies on the whole inversely with the density of the population, so that of the larger islands Borneo and New Guinea have the highest percentage and Java the lowest (Fig. 47).

Forest Types

The chief types of forest have been described in some detail in vol. I, ch. XII of this Handbook, and estimates of their area are given in the table on p. 235, but it is necessary to emphasize here some features which are of economic importance. By far the greater proportion of the forests of the East Indies, in fact nearly all those except in areas with a strong east monsoon (east and central Java, Lesser Soenda islands and southern Moluccas), are mixtures of tall evergreen hardwoods, the 'tropical rain forests' of botanists. In these forests there are enormous numbers of different kinds of trees, but only comparatively few of these kinds are of much value as timber. Because these rain forests are so mixed in composition, and because the useful timbers are scattered through a mass of more or less valueless trees, these rain forests are not as valuable as they might appear to be, and their economic exploitation is a difficult problem.

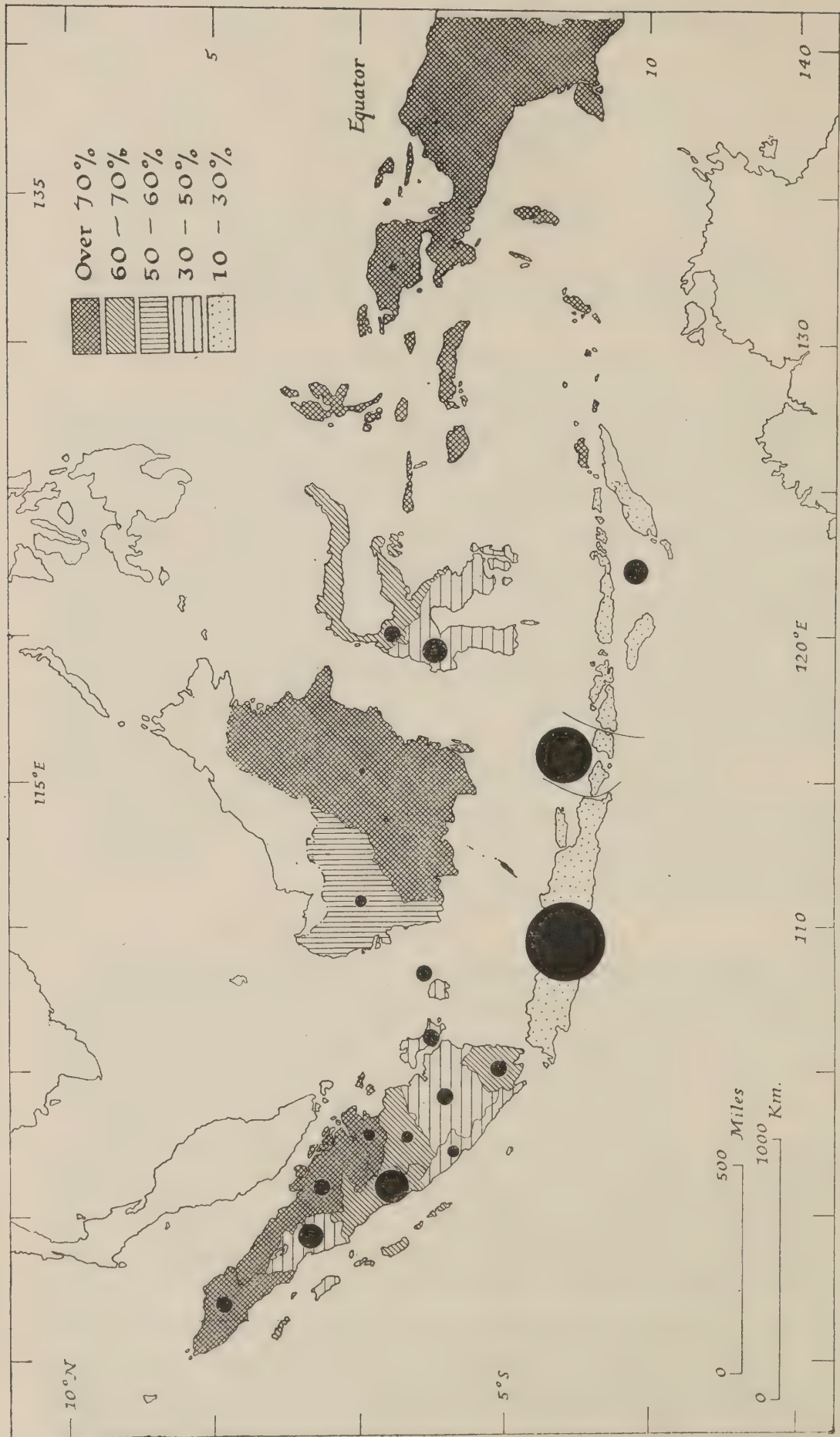


Fig. 47. The relation between forest area and population density in the Netherlands Indies
The shading indicates percentage of forest cover in each Residency; the circles show the population density in different areas according to the following scale :—
Circles: 1 mm. radius = 2 per sq. km. 3 mm. radius = 15 per sq. km. 11 mm. radius = 170 per sq. km.
2 mm. radius = 5 per sq. km. 4½ mm. radius = 30 per sq. km. 15 mm. radius = 310 per sq. km.
Source: *Indisch Verslag*, vol. II, 1938, pp. 283, 286 (Batavia, 1938).

	Sumatra and Riouw	Bangka and Billiton	Borneo	Celebes	Lesser Soenda islands	Moluccas and New Guinea	Total for Outer Provinces	Java and Madoera	Total for Netherlands Indies
Evergreen forest with few Dipterocarps	44.5	0.25	22	24.9	5.2	84	180.85	5.4	186.25
Dipterocarp forest	18.5	0.25	79	—	—	—	97.75	—	97.75
Mixed Deciduous forest	—	—	—	—	2.5	—	2.5	—	2.5
Teak forest	—	—	—	0.05	—	—	0.05	2.0	2.05
Agathis forest	—	—	—	7.4	—	7.9	15.3	—	15.3
Casuarina forest	—	—	0.12	—	0.2	—	0.32	—	0.32
Eucalyptus forest	—	—	—	—	0.22	—	0.22	—	0.22
Mangrove forest	1.7	0.2	3.7	0.5	0.07	2.5	8.67	—	8.67
Sago forest	—	—	—	—	—	19	19	—	19
Grassland with <i>Pinus</i> <i>Merkusii</i> woodland	1.5	—	—	—	—	—	1.5	—	1.5
Area of forest reserves at end of 1934	15.3	1.2	3.9	1.0	1.7	—	23.1	6.4	29.5
Total primary forest	56.2	0.7	104.82	32.85	8.19	113.4	324.66	7.4	332.06
Secondary forest	18	3	17.3	2.47	—	0.07	40.84	—	40.84
Total of primary and secondary forest	74.2	3.7	122.12	35.32	8.19	113.47	365.5	7.4	372.9
Forest area according to the <i>Indisch Verslag</i> , 1938	71.7	1.4	103.8	24.9	3.2	93.9	298.9	7.4	306.3
area	128	4.2	133	46.9	19.3	137	468.4	37	505.4

Source: J. W. Gonggrijp, 'De bebossing van Nederlandsch-Indië', *Tectona*, vol. xxxi, p. 47 (Buitenzorg, 1938), and *Indisch Verslag*, vol. II, 1938, pp. 283, 286 (Batavia, 1938).

Only exceptionally are rain forests found in which one species forms a clear majority of the whole stand; the *bilian* or ironwood forests of parts of Borneo and Sumatra are an example. In the drier areas, where there are several successive nearly rainless months during the east monsoon, the evergreen rain forests give place to forests which lose their leaves during the dry season. The most important type of forest in this class is the teak or djati forest, which covers nearly 1,977,000 acres in east and central Java as well as smaller areas in the Lesser Soenda islands and Celebes. In this kind of forest the great majority of the trees are teak, so that the composition is much less mixed than that of the rain forests; for this reason, and because of the unique properties of the teak timber, the teak forests are of far greater economic importance than the rain forests. The forest administration has always given much more time and attention to them than to any of the other types of forest and for administrative purposes the forests are grouped into *djatibosschen* and *wildhoutbosschen* or 'wild timber forests'.

In addition to the rain forests and teak forests which grow on well-drained land, there are freshwater swamp forests and the mangrove forests, which grow between the tide marks on the muddy shores of estuaries and sheltered bays. The former are of small economic value, but the latter are of considerable importance, mainly as a source of firewood.

Secondary Forest

When virgin or primary forest (whether rain forest or deciduous forest) is felled, the ground if left to itself will become covered with a dense growth of trees in a very short time. This new vegetation is known as 'second-growth' and gradually, generally in less than twenty years, it develops into a 'secondary forest' which differs in various ways from the original primary forest. It consists mostly of rapidly-growing softwoods which are useless as timber and of very little value for any purpose. These fast-growing soft-wooded species are gradually replaced by slow-growing hard-wooded species characteristic of primary forest, but this process takes a very long time, how long is not known, but perhaps over a hundred years. If after the primary forest is felled the second growth is not left alone, but is grazed or repeatedly burned, no secondary forest will develop, and the land may be invaded by *alang-alang* or other grasses, or may become a thicket of shrubs or ferns. In most parts of the Netherlands Indies, particularly in the Outer Provinces, the practice of *ladang* or

shifting cultivation has led to the felling of huge areas of primary forest and a large proportion of the land reckoned as forest is in fact secondary forest and second-growth containing very little useful timber. There are also large areas where the forest has been replaced by *alang-alang* and scrub. The amount of untouched primary forest remaining is not known and may be much less than is generally thought; in any case the forests are certainly not inexhaustible.

ECONOMIC VALUE OF THE FORESTS

Among the timber trees of the Netherlands Indies the teak, as has been mentioned, holds unchallenged pre-eminence owing to its strength, durability and suitability for shipbuilding and many other purposes. It has, too, the advantage that it grows naturally in nearly pure stands which are easy to exploit and lend themselves to silvicultural management. Teak forests are a characteristic feature on the



Fig. 48. Teak forests of Java

Source: *Atlas van Tropisch Nederland*, plate 17 (Batavia, 1938).

porous and infertile limestone soils of the low hills in the Rembang, Semarang, Madioen and Kediri Residencies of Java, but the teak forests outside Java are of comparatively slight importance. The teak tree will not grow successfully in districts where there is not a well marked dry season in the year. From the earliest days of European colonization the teak forests have been regarded as one of the chief assets of Java, but in the time of the Dutch East India Company, and for a long time afterwards, they were exploited in a reckless and destructive fashion. The establishment of proper administrative control over the forests led to great improvements and at the present day the teak forests of Java are among the best managed and most profitable in the tropics.

The obvious attractions of teak have tended to lead to the neglect of the many other valuable timbers. The majority of these are found in mixture in the rain forests and there is still much to learn about their individual properties and uses before they can be satisfactorily

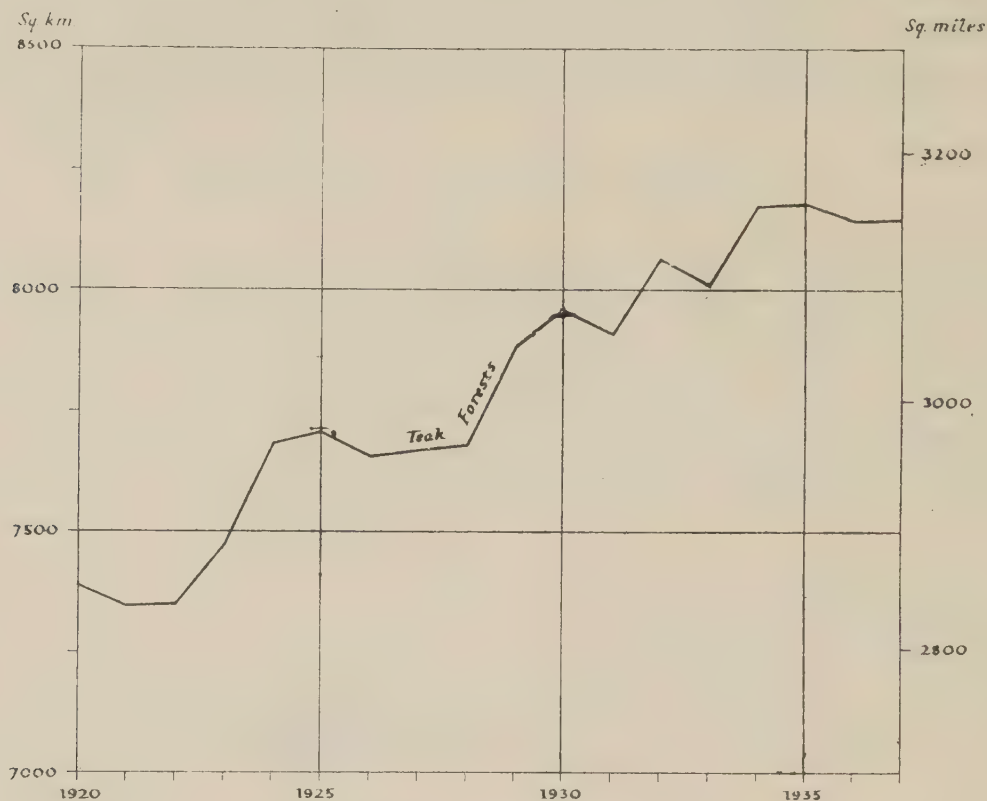


Fig. 49. Area of teak forests in Java

Source: *Indisch Verslag*, 1938, vol. II, p. 283 (Batavia, 1938).

utilized and marketed. Among the timbers of outstanding value may be mentioned the many trees of the family Dipterocarpaceae, known as meranti and under various other names, the kapoer or Borneo camphor, a straight-growing tree of great height which sometimes (e.g. in Atjeh) grows in nearly pure stands, the rasamala (*Altingia excelsa*), a forest giant characteristic of the mountain forests of western Java, and the Borneo ironwood (*Eusideroxylon Zwageri*), a hard timber, approaching teak in durability, which is abundant in parts of Borneo and Sumatra, but absent in Java. Besides these heavy timbers which are mainly suitable for constructional work, there are many beautiful ornamental woods, notably the Macassar ebony, which is the wood of various species of *Diospyros* found chiefly in the northern part of Celebes.

Among soft woods, the toesam or Sumatran pine, a native of the mountains of the Gajo region and elsewhere in Sumatra, deserves

mention. In recent years it has become of some importance as a source of resin and turpentine, as well as of a useful timber.

Another timber which occupies a unique place is the sandalwood (*Santalum* species) which is found chiefly in Timor and the neighbouring islands. The scented wood is highly prized, especially by the Chinese, who use it for ceremonial purposes and in 1929 the price of Timor sandalwood was as much as f 50 the pikol (131·161 lbs). The approaching exhaustion of the native sandalwood has led to the establishment of plantations, though on a small scale.

Besides timbers in the ordinary sense, there are also bamboos, used by the natives for innumerable purposes, and the poles of the niboeng palm which form an essential part of the fishing gear of the Sumatran fisherman. At the great fishing port of Bagansiapiapi some 50,000 of these poles are needed yearly and the Forestry Service has been forced to give some attention to the problem of maintaining and regulating the supply.

Wood is important for the manufacture of charcoal and the Forestry Department has recently explored the possibilities of using East Indian timbers as a raw material for manufacturing cellulose and products such as kraft paper. A number of timbers, including some of the native conifers and species of *Eucalyptus*, were tested and found to be suitable for the purpose.

A very important contribution of the forests to the economy of the Netherlands Indies consists of the so-called 'minor forest products', such as jelutong and other gums, dammar, resins and rattans. These products, which come mainly from the Outer Provinces, especially from remote and undeveloped areas such as the interior of Borneo and Celebes, are collected and transported by the natives by the most primitive methods, but together they form an economic asset of much greater importance than is generally realized. In 1938 they contributed at least 13 million guilders to the national income, as compared with 16 million from timber and wood products. In the same year, the value of the 'minor forest products' exported to foreign countries was 11·4 million guilders, which was about twice the value of the timber exported and represented about an eighth of the whole export of native production (including rubber and copra). The forestry authorities have recently come to realize that these 'minor forest products' are so important that more attention should be given to grading and regulating quality, as well as to maintaining the supply. The trees from which some of these products are obtained are in some cases in danger of extermination and already have to be sought

in more and more inaccessible areas. In Celebes, for instance, the older trees of the Kauri pine, *Agathis*, from which a valuable resin is obtained, are being tapped to death and unless it is replanted the species will soon disappear.

It would be a great mistake to measure the economic importance of forests merely by the value of the timber and other products obtained from them. This fact has long been realized by the government of the Netherlands Indies and is the basis of its far-sighted policy of forest reservation. Besides their productive value, forests may be important for conserving water supplies and play a vital part in protecting the soil surface against erosion. The water-conserving and soil-protecting functions of forests are particularly important in mountainous tropical countries, such as Java, where there is a high rainfall mostly falling as heavy downpours and not evenly distributed through the year.

The older view that the presence of forests has a significant effect in directly modifying rainfall is now discredited, but forests are certainly more efficient than most other forms of soil cover in storing and regulating the run-off of rain water. It is generally held that the mountain forests of Java, for instance, are essential to the prosperity of the agriculture on the plains below. They conserve the heavy rainfall of the west monsoon and allow it to run off gradually during the east monsoon so that the rivers never run entirely dry and a water supply for irrigation is available all the year round. It is for this reason that these forests have been preserved, and not because of their productivity, which is small. In some parts of Java, such as the basin of the Kali Brantas and north Bondowoso, large areas of *sawah* under rice have become less productive or even completely infertile in recent years owing to the failure of the water supply for irrigation, which is generally believed to be due to the reduction of the forest area on the neighbouring mountains below the necessary minimum, a state of affairs which can only be remedied by systematic afforestation. Though forests have generally been thought to be indispensable for maintaining water supplies in countries such as Java, some authorities have claimed recently that with proper precautions perennial agricultural crops such as tea, coffee and cinchona can provide a soil cover which is equally efficient in regulating run-off.

Whether the value of forests in maintaining water supplies is over-rated or not, their importance in protecting the soil against erosion is unquestioned. Soil erosion consists in the removal of the surface layers of soil, including the essential humus-containing layers, by

various agencies, especially rain water. The erosion may take the form of the carving out of gullies, or the whole of the surface may be removed more or less evenly. In the East Indies, especially in Java and Sumatra, the torrential downpours of rain, the high annual total of rain and the steep slopes all tend to favour erosion, but damage is not on the whole serious compared with many other parts of the world, except in limited areas, e.g. on loose volcanic ash and on the marl-like *schuifgronden*. The chief reason for the small amount of erosion is that in the Netherlands Indies bare ground, unless kept clean of weeds, rapidly becomes covered with vegetation. In the mountains the forests play a very important part, as experiments have shown. Thus in 1939 an experimental area of forest at 'Tjiwidej on the slopes of Goenoeng Patoeha in Java was clear-felled and planted with native crops. Under the forest cover, and for the first year after clearing, erosion was negligible, but in 1940 with a rainfall of about 137 in. erosion had reached a figure of about 1.1 lb. per sq. ft.

The substitution of cultivation for forest need not necessarily lead to extensive erosion. The system of growing rice on flooded terraces or *sawah*, for instance, is about as perfect an arrangement for checking erosion as can be devised, and even the *ladang* system of shifting cultivation, as practised in the Outer Provinces, is unlikely to lead to serious damage so long as the covering of the soil by second-growth vegetation is not interfered with by burning. Many agricultural systems, however, are extremely destructive and bring about rapid erosion, especially on steep slopes, for instance the Javanese method of growing rice for long periods in 'dry' (unirrigated) fields or *tegallan*. Even under a perennial crop, such as tea, erosion may reach large dimensions. Thus in the Preanger Residency in Java the tea bushes have in places had their roots laid bare and observations show that a layer of soil 20 in. deep has been washed away in ten to twenty years. It appears then, that, though with careful precautions, such as terracing and digging of catchment trenches, erosion need be no greater than under the natural forest cover. When agricultural practice is not of this high standard, as in the backward areas of the Outer Provinces, the present policy of reserving large areas of forest must be maintained, in the interests of soil and water conservation as well as in order to ensure a supply of timber for the future. A forest can, of course, yield timber as well as serving for protection and it has recently been suggested that in east Java, where the population is dense and land precious, the present comparatively unproductive protection forests should be replaced by plantations able to supply the

local need for timber, fuel, cellulose, tannin, turpentine and other products.

FOREST POLICY AND ADMINISTRATION

The control and administration of the forests in Java and Madoera is highly organized and efficient. In the Outer Provinces forestry is more backward, but the condition of the forests does not compare unfavourably with many other tropical countries.

Until quite recently the attention of Europeans was directed entirely to the teak forests of Java. In the early days of colonization, under the Dutch East India Company, the exploitation of the teak was destructive and unsystematic, with no regard for maintaining a steady output or for conserving the forest resources for future generations. There was a heavy demand for timber for building wharves, warehouses and boats and for all these purposes teak was mainly used. Already in the second half of the eighteenth century the north coast of Java had been stripped of valuable timber and teak had to be sought from the less accessible inland forests. At this period the inland Regents (the highest class of native officials) were required to deliver fixed 'quotas' of teak to the agents of the company. The felling and extraction were done by a system of forced labour; the inhabitants of certain villages were exempted from other 'quotas' in exchange for a teak 'quota'. These villagers became known as the *blandong* people and, as the teak 'quotas' were generally oppressive, their condition was miserable. Under Governor-General Daendels attempts at reform were made and the wood 'quotas' of the inland Regents were abolished, but they were reimposed later and the *blandong* system did not finally disappear till 1865.

With the ending of the Culture System and the enforced *blandong* labour, the forests were left for a time, in accordance with the *laissez-faire* ideas of the day, to the mercies of private contractors. This system, however, did not prove satisfactory, for, though clear-felling took the place of indiscriminate selection-felling, little or no attention was paid to re-planting.

The earliest attempts at scientific forest conservation date from 1849 when a few German forestry experts were installed in the forests of Rembang; in 1857 scientifically trained foresters were also sent out from the Netherlands. Great improvements in the management of the teak forests followed the appointment of the first Inspector of Forestry (*Inspecteur voor het Boschwezen*) in 1858.

The Forest Ordinance (*Boschreglement*) of 1897 instituted a system under which the teak forests were to be divided gradually into ranges (*houtvesterijen*) varying in size from 6,178 to 24,711 acres (later enlarged to 37,070 to 74,130 acres), each under the supervision of a university-trained forester. Each *houtvesterij* was to be exploited by the government, not by private contractors, following a working plan based on an exact survey of the growing stock. Until the parcelling out of all the teak forests into *houtvesterijen* could be completed, which would take many years, the remaining forests were divided into larger areas called *boschdistricten*. For these only rough working plans were prepared and exploitation was left to private enterprise. The system begun in 1897 has lasted with various modifications till the present day. During the interval the transference of the forests from *boschdistricten* to *houtvesterijen* has been almost completed and the exploitation of the teak forests has thus passed mainly into the hands of the government.

The trees are felled with axes and saws, or are dug up, and afterwards sawn into logs. Sound trees are made into round logs, hollow ones into square logs which are cut into beams, railway sleepers, etc., the wastage being used as firewood. The logs are drawn by buffaloes or bullocks to the nearest road or light railway. An extensive system of narrow-gauge railway lines has been constructed for timber haulage, amounting in 1928 to 1,119 miles. The trucks are generally pushed along the lines by coolies, but in the Rembang district, the chief centre of the teak industry, light steam engines are used to bring the logs to the main timber yard at Tjepoe.

While the teak forests have thus attracted attention for a very long time, the jungle forests or *wildhoutbosschen* were entirely neglected up till 1865. The forest ordinance of that year encouraged the reservation of the mountain forests of Java for protective purposes and a supplement to it in 1884 proposed a systematic policy of forest conservation by prescribing that the following classes of forests should be reserved in the interests of water supplies: (i) mountain forests in west Java above 5,000 ft. and those in east Java above 4,000 ft., (ii) forests on hill tops in less mountainous districts, (iii) forests within a distance of 328 ft. of springs and lakes. Forests to be reserved were termed *bosschen in stand te houden*, while forests which it was not considered necessary to reserve were termed *niet in stand te houden*. Though policy in regard to the *wildhoutbosschen* was at first purely negative and conservative, steps were taken later to ensure their rational exploitation and working plans have been drawn up for some

of the mountain forests of west Java which contain valuable timber. Generally speaking, however, the *wildhoutbosschen* of Java are mainly of value for protection and the difficulties of the terrain make large-scale exploitation difficult.

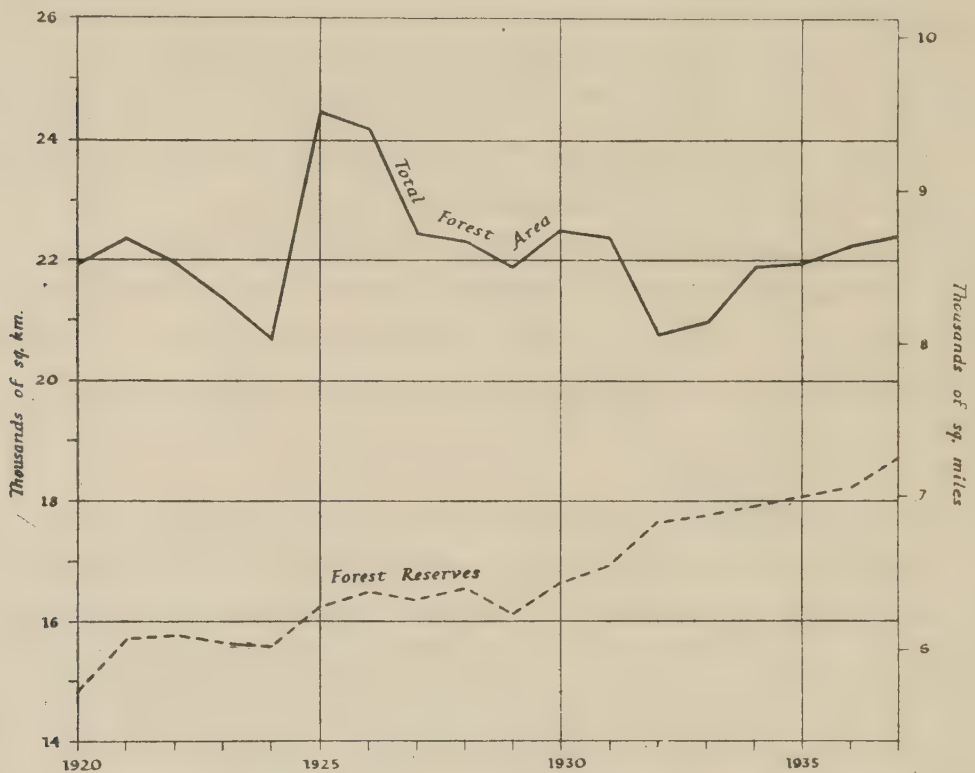


Fig. 50. Forests and forest reserves (excluding teak), Java and Madoera
Source: *Indisch Verslag*, 1938, vol. II, p. 283 (Batavia, 1938).

Besides conserving and controlling the exploitation of the native forests the Forest Service has in recent years carried out an active policy of afforestation in several parts of Java. For this purpose indigenous trees as well as introduced trees not native to Java, such as species of *Eucalyptus*, have been extensively planted. In some districts afforestation has been carried out by the *kemlandingan* method. This consists of interplanting the rows of young trees with food crops or even rubber. The natives are allowed to plant these crops and have the benefit of them on condition that they plant and care for the young trees.

The forests of the Outer Provinces, which as has been stated are chiefly *wildhoutbosschen*, received very little attention until quite recent years. A policy of forest conservation was begun in Sumatra in 1910. Since then large areas of forest in the Outer Provinces have been explored and surveyed and much research has been done to

determine the botanical identity of the trees, as well as the properties and uses of their timbers. The chief concern of the forest administration in the Outer Provinces has been to demarcate and reserve forests in areas where deforestation threatens to become dangerous. By 1937, 252,040 acres had been reserved. Exploitation is left mainly to private enterprise operating either in 'forest concessions' (grants of land up to 887 acres in area leased for thirty years for a fixed duty plus a royalty on the timber removed) or more often by 'felling licences'. Exploitation is carried out by the natives on a fairly large scale in south Borneo and in the Palembang district of Sumatra. In Bengkalis (Sumatra) and the Riouw archipelago the Chinese *panglong* timber cutters have built up a considerable industry, the products of which are sold in Singapore. The *panglong* work with primitive methods and small capital and rarely penetrate far from the coast or river banks.

In 1930, just before the economic crisis enforced retrenchment, the Forest Service of the Netherlands Indies consisted of a Chief Inspector, 11 Inspectors, and 123 Assistant Conservators, all trained in European universities. There were also 165 rangers, surveyors,

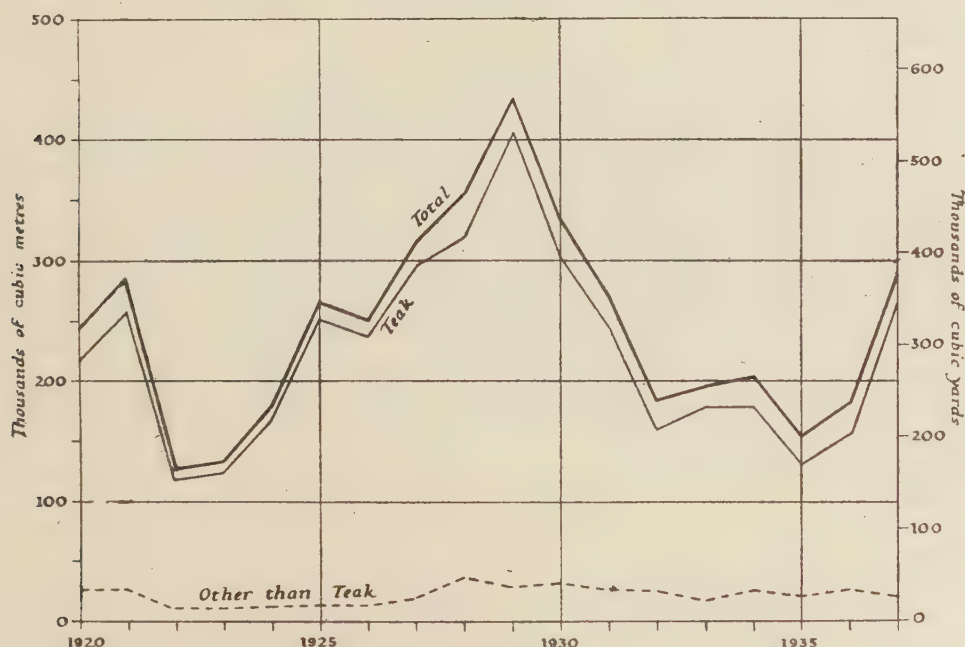


Fig. 51. Timber production, Java and Madoera

Source: *Indisch Verslag*, 1938, vol. II, p. 283 (Batavia, 1938).

etc., most of whom were Europeans, and 2,073 native foresters, forest guards, timber-yard overseers and foremen. There is a Forest Experimental Station (*Boschproefstation*), founded in 1913, which deals with research. The Forest Service works in five divisions, viz. the Division

of Survey and Working Plans, the Forest Experimental Station, the administration of the Java teak forests, the administration of the Java *wildhoutbosschen* and the administration of the forests of the Outer Provinces. From 1905 onwards the Forest Service was under the control of the Department of Agriculture (later known as the Department of Agriculture, Industry and Commerce), but in 1934 it was transferred to the newly-found Department of Economic Affairs.

The large amount of attention given to forestry has been fully justified by the results. The net revenue of the Forest Service rose from f 1,120,000 in 1897 to f 7,125,200 in 1928. Though there was a loss during the depression years 1932-35, revenue rose again to f 2,140,000 in 1937. The value of the timber exported in 1936 from Java and Madoera was f 837,000, and from the Outer Provinces, f 3,593,000. The total amount of timber felled in Java by the government was 1,013,534 cu. ft.

Fig. 51 shows the production of the teak forests in recent years, and the production of other forests in Java and Madoera. Similar figures for the forests of the Outer Provinces are not available.

BIBLIOGRAPHICAL NOTE

Statistics and other official information concerning the forests of the Netherlands Indies can be found in the Yearbooks of the Department of Agriculture, and since 1934 in those of the Department of Economic Affairs. The following works may also be consulted: J. W. H. Cordes (edited by A. E. J. Bruinsma), *De djatiboschen op Java, hun natuurlijke verspreiding, geschiedenis en exploitatie* (1881); G. S. Lugt, *Het boschbedrijf in Nederlandsch-Indië* (1912). A valuable journal, *Tectona*, is published in Buitenzorg under the auspices of the Society of Higher Forestry Officials in the Netherlands Indies, containing articles (in Dutch, but mostly with English summaries) on matters of research, practical and administrative interest connected with the forests.

Chapter VIII

MINING

Mineral Resources: The Administration of Mining: Petroleum:
Tin: Other Minerals: Bibliographical Note.

MINERAL RESOURCES

General Features

The Netherlands Indies have long been famous for their mineral wealth, and already at the beginning of the Christian era they were known in India and in the West as the land of gold and silver. The earliest Chinese reference to Java mentions the working of salt in A.D. 13, and there is evidence that even much earlier the native Indonesians were acquainted with gold, copper, bronze and iron. The first European travellers brought back tales of the diamonds of Borneo. A new and more utilitarian note was struck in the sixteenth century by a Portuguese reference to tin, and the monopoly of tin was a minor source of profit to the Dutch East India Company during the eighteenth century. Sir Stamford Raffles was the first to introduce control over the tin fields, but not until the last half of the nineteenth century was there any attempt at scientific exploitation of the tin and other minerals. Coal attracted attention from about 1850, and petroleum from the nineties. At the beginning of the present century, however, mineral products accounted for little over one-tenth of the total value of exports, and tin was still the only item of importance. With the rapid exploitation of the rich oilfields, the contribution of

Export of Tin and Petroleum Products

Year	Value (f mil.)	Per cent. of total exports
1900	29	11
1913	149	22
1925	267	15
1937	249	25

Source: *Statistical Abstract of the Netherlands Indies*, 1940, Tables 123-5 (Batavia, n.d.).

minerals to the value of exports increased, and by 1937 had risen to a

quarter, partly owing to greater production, and partly owing to changes in the relative prices of mineral and agricultural commodities. Petroleum, tin, coal and salt were still the most valuable assets, but from 1935 onwards there have been increasing exports of bauxite.

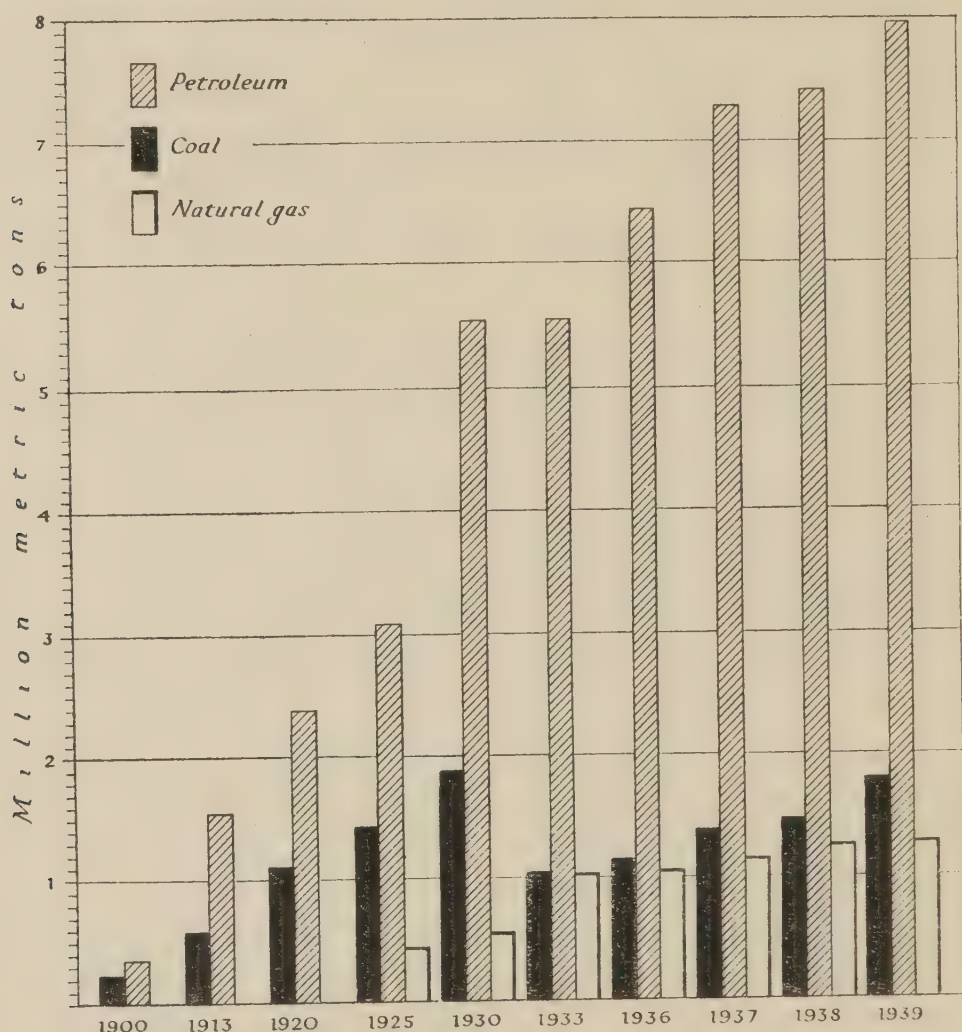


Fig. 52. Growth of coal and petroleum production, 1900-37

Source: *Statistical Abstract*, 1940, Tables 74-5.

Distribution of Minerals

Petroleum is widely distributed. In Sumatra the chief centres of production are in the Residencies of Atjeh, Oostkust, Djambi and Palembang; there are fields both in central Java and in east Java; another important centre is in east Borneo and the adjacent islands, Tarakan and Boenjoe. In addition, oil is obtained in small quantities from Ceram and is known to occur in New Guinea, Celebes and Timor. The production of tin on a large scale is confined to a few islands off the east coast of Sumatra, but a small amount is won by natives along the west coast of this island.

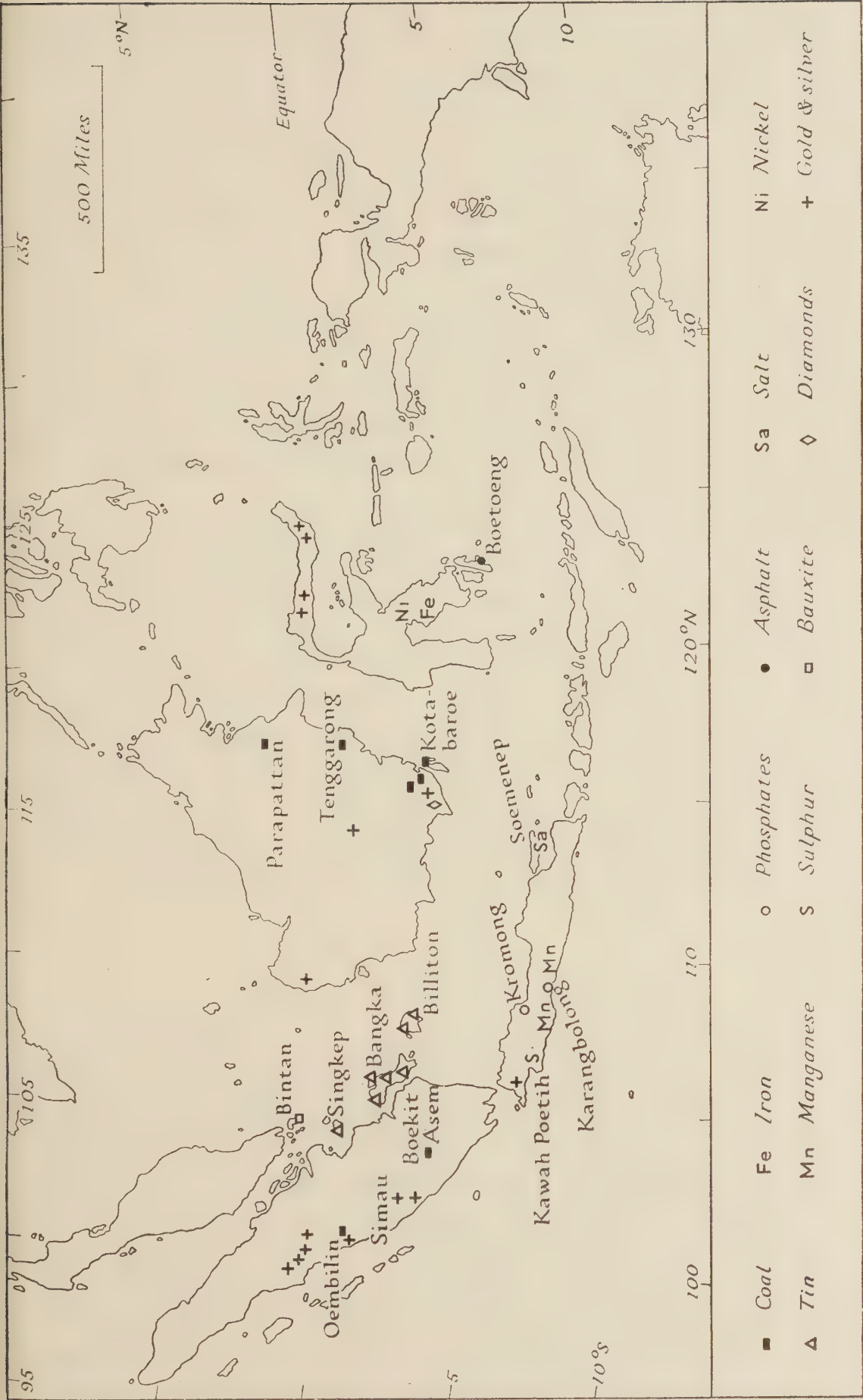


Fig. 53. Distribution of mineral resources

Source: *Atlas van Tropisch Nederland*, plate 8 (Batavia, 1938).

Among the mineral products of less importance are coal, bauxite, gold and silver. There are extensive coal mines near Padang and in Palembang Residency in Sumatra, and in south-east Borneo; there are also small native workings in west Borneo. Bauxite is worked in Bintan, an island off the east coast of Sumatra. Gold is widely distributed, but only in Sumatra is it won on any considerable scale, though it is also worked in Borneo and in the Manado district of Celebes. Silver is found in association with the gold, but the working of silver is practically confined to Sumatra. Borneo still yields diamonds, but the total value is insignificant. Manganese is found in the Jogjakarta and Preanger districts of Java; phosphates in Java from Cheribon to Rembang; and sulphur from Kawah Poetih and other volcanic craters in Java. Springs containing iodine are found in many places, but it is extracted only at Soerabaja. In Borneo there are extensive iron fields, as yet unexploited.

The principal salt-producing localities are in Madoera, but there are coastal salt-pan areas of less importance elsewhere in Java and in Atjeh, north and south Celebes, Timor and other islands of the Timor group, and in Bali and Lombok. Limestone is found in many parts of Java and in the Benkoelen and Westkust Residencies of Sumatra—in the latter it is used for the manufacture of Portland cement. Marl is worked near Padang for the local cement factory. Kaolin (china-clay) is worked in Preanger and Palembang, and trass in the Pekalongan and Preanger Residencies. The chief sources of building clay are the Djapara-Rembang area of northern Java, Palembang in Sumatra, and on a smaller scale, south Celebes.

THE ADMINISTRATION OF MINING

Until the middle of the nineteenth century the mineral wealth of the Netherlands Indies was closed to private enterprise. One of the earliest achievements of the Liberal reaction against the Culture System was a decree of 1851 sanctioning the grant of concessions outside Java and Bangka. About the same time, mining engineers were appointed to survey the mineral resources. Although they reported favourably on many sites, there was little response from capitalists, and in 1873 the regulations were amended to make concessions more attractive; they added Java to the field for private enterprise and provided that, except by special orders of the Crown, all new concessions and all renewals should be thrown open to public

competition. But grantees were liable to hindrance by the surface rights of cultivators, and were required to show that they had sufficient capital; also plantation agriculture was at that time more attractive. Thus the new regulations were little more effective than the former in attracting capital.

Meanwhile there was a growing demand that mining enterprise should be controlled by law. This took effect in the Mines Law of 1899, which did not become operative, however, until Rules under the Act were published in 1906. This law has formed the basis of subsequent legislation. In the first instance it applied only to the area under direct rule. But in territories where the Short Declaration (see p. 92) is in force rights over minerals coming under the Mines Act were withdrawn from the rulers under the Native States Regulation of 1927; in the remaining States the current Long Contracts gave control over mining rights to the central government. Thus a uniform mining policy could be enforced over the whole of the Netherlands Indies. The Mines Law distinguishes surface rights and subsoil rights; surface rights convey no title over certain specified minerals, but unspecified products, such as chalk and limestone, remain at the disposal of the cultivator under the ordinary civil law, or, if on waste land, at the disposal of the government by regulation; it also distinguishes between prospecting and mining, and provides for the grant of prospecting licences over wide areas on easy terms for a short period, and mining leases over restricted areas on rigorous terms for a long period. Concessions may be granted only to Dutchmen, to inhabitants of the Netherlands or Netherlands Indies, or to limited companies registered in the Netherlands or Netherlands Indies, with a majority of the directorate domiciled in either of these territories.

When the Mines Act was passed the prejudice against State interference with private enterprise still survived, and with a view to reducing this to a minimum it was decided to take a share, fixed at 4% of the gross yield; a prospector had to pay in addition a rent of 2½ cents per hectare, and a mining lessee a rent of 25 cents per hectare. Socialists were already advocating State exploitation and when the law became operative they found support from the Governor-General, Van Heutsz. The law was therefore amended in 1910 so as to allow the State either to exploit mineral fields or to enter into 'exploitation contracts' with private companies to exploit the fields on terms more favourable to the State than concessions on the above lines. The rapid increase in the political importance of oil for export introduced

new considerations. It was deemed undesirable to allow private capital, foreign and conceivably hostile, to exploit a product so vital to the public welfare, and in 1918 the Mines Law was further amended by dividing into two groups the minerals which it covered; in respect of one group, comprising fossil fuels, coal, mineral oil and iodine, exploitation was reserved to the State, except by special legislation in respect of each concession. On the other hand some apprehension was felt as to the political reactions of State ownership over oilfields. A solution was found in an Act of 1921 which provided for joint exploitation by the State and a private company, in which the State should have a controlling interest. The prudence of this measure was apparent in recent conversations with Japan, when the demands of Japan for large quantities of oil-products could be referred to the companies interested on the ground that the government, as such, took no active part in the oil business.

Thus there are now four forms of ownership under which minerals are won: (1) State ownership, in which the State owns and works the field; (2) joint State and private ownership in which the State has a controlling interest in a private company and the latter works the field; (3) exploitation contracts in which the State participates in the net profits; and (4) ordinary concessions in which the State receives only a share of the gross profits, plus the rent. Formerly five concerns were owned and worked by the State: the Bangka tin mines; the Oembilin, Boekit Asem and Poelau Laoet coal mines and the Tambang Sawah gold and silver mine; the last two were closed down in 1931. There are two joint concerns: the *Nederlandsch-Indië Aardolie Mij.*; and the Billiton Tin Co. In 1938 arrangements were completed for the amalgamation of the Bangka and Billiton concerns, but owing to the outbreak of war this project was suspended. Of the exploitation contracts the most important is that with the *Nederlandsche Koloniale Petroleum Mij.* for the winning of oil in Palembang; the more recent oil concessions have been granted by special legislation under the amended Mines Act, but most of them were granted, for a period of seventy-five years, before 1918. At the end of 1935 there were 235 leases current in respect of minerals specified in the Mines Act, and 163 permits in force for other minerals.

In order to obtain a concession the first step is normally to apply to the local representative of the government for a prospecting licence. This may cover 24,710 acres and is valid for three years, but may be withdrawn after one year if not utilized; it may be extended for two periods of one year each if good cause is shown. The next step is an



Fig. 54. Distribution of oilfields and refineries

Based on official sources

application by the prospector for a mining lease. The application must be submitted to the Governor-General with full details regarding the minerals to be worked and the methods proposed for working. A lease may cover an area of 2,470 acres and extends up to seventy-five years.

PETROLEUM

Although the existence of oil seepages has been known for many years, it was not until 1893 that commercial production started; between 1890 and 1900 there was great activity in the development of oilfields in Sumatra, Java and Borneo, as well as in the adjoining territories of Sarawak and Brunei. Up to the end of 1940 more than 1,000 million barrels of oil and large quantities of natural gas had been produced in the Netherlands Indies. There is storage capacity for two to three million metric tons, of which at least one million is for refined products. The characteristics of crude oils from the various fields, and particulars of refineries are given in the tables on p. 259.

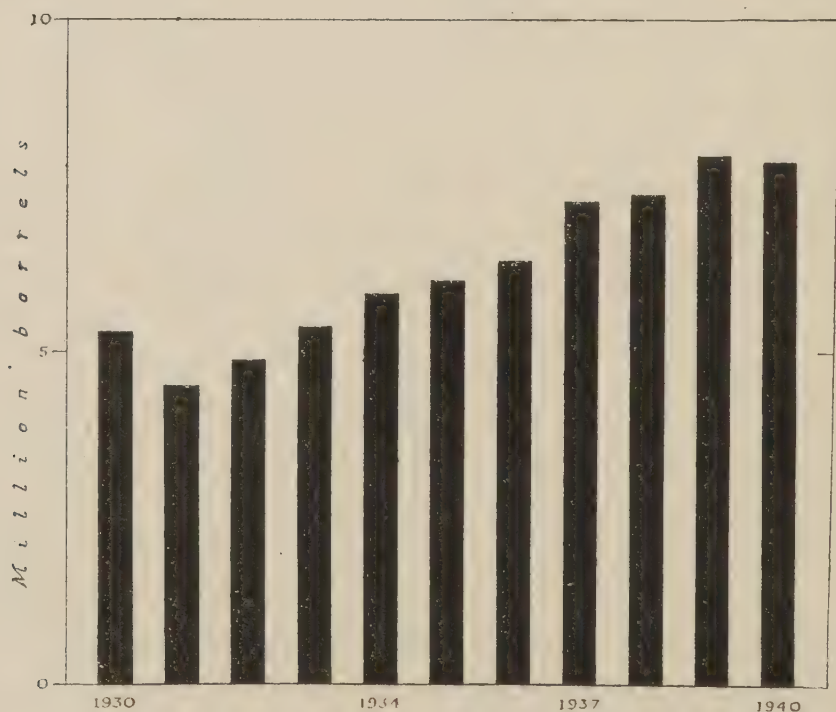


Fig. 55. Oil production, 1930-40

Based on official sources.

The larger oil companies, the area in which each operates and the tonnage produced in 1940 are given in the following table:

Company	Area	Production in 1940 (metric tons)	Controlling Interest
<i>N.V. De Bataafsche Petroleum Maatschappij (B.P.M.)</i>	N. & S. Sumatra E. Java N.E. & E. Borneo Ceram	4,545,000	Royal Dutch-Shell Group
<i>N.V. Nederlandsch-Indische Aardolie Maatschappij (N.I.A.M.)</i>	S. Sumatra (Djambi) Poelau Pandjang (N.E. Sumatra)	1,305,000	N.I. Government and B.P.M.
<i>N.V. Nederlandsche Koloniale Petroleum Maatschappij (N.K.P.M.)</i>	S. Sumatra (Palembang) E. Java (Rembang)	2,082,000	Standard-Vacuum Oil Co.
<i>N.V. Nederlandsche Pacific Petroleum Maatschappij (N.P.P.M.)</i>	Mid. Sumatra (E. Coast) N. Java	not known	Standard Oil Co. of California and Texas Corpora- tion
<i>N.V. Nederlandsche Nieuw Guinee Petroleum Maatschappij (N.N.G.P.M.)</i>	New Guinea (Vogelkop)	—	40% Royal Dutch Group; 40% Standard-Vacuum through N.K.P.M. 20% Caltex through N.P.P.M.
<i>Borneo Olie Maatschappij</i>	E. Borneo (Mangkalihat peninsula)	—	Japanese interests

Based on official sources.

North Sumatra

The oil-bearing formations are of Tertiary age and run from north-west to south-east parallel to the main mountain ranges of the island (see p. 57 of vol. I of this Handbook). The chief fields at present worked by the *B.P.M.* are Rantau, Perlak, Serangdjaja and Paloe Taboehan. The old fields of Telaga Said and Darat were formerly exploited by this company but have been practically exhausted. Exploration of other areas to the north and south of these fields was proceeding actively before the war. The *N.I.A.M.* work a small oilfield on Poelau Pandjang, which lies north of Pangkalansoesoe (see vol. I, pp. 91-2 of this Handbook). The bulk of the production comes from the Rantau fold, a field which was discovered in 1929.

Mid. Sumatra

Oil is known to occur between the Soengai Rokan and S. Kampari;

this district was being explored by the *N.K.P.M.* and the *N.P.P.M.* The former company has discovered a small field at Lirik in the Inderagiri district.

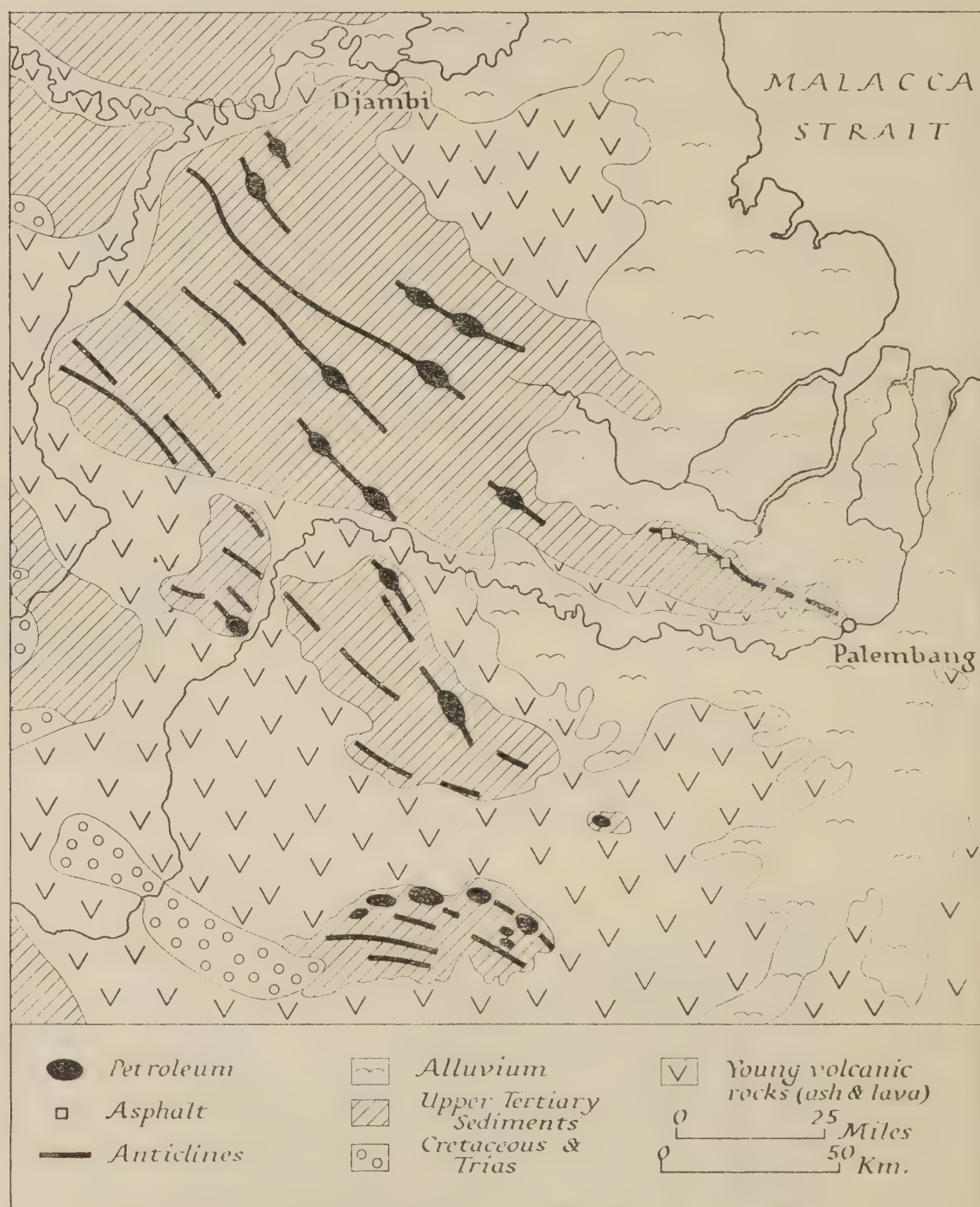


Fig. 56. The Palembang-Djambi oilfield

Based on 1 : 1,000,000 *Geologische Overzichtskaart van den Nederlandsche-Indischen Archipel*.

South Sumatra

The Djambi-Palembang region is the chief oil-producing area of

southern Sumatra (see vol. 1, p. 82 of this Handbook). In the Palembang Residency oil has been produced since 1898, principally on the Babat and Moearaenim concessions and along the Soebandjeridji anticline; the older wells varied in depth between 330 ft. and 2,300 ft. and tapped Lower Pliocene and Miocene sands. Wells down to 6,300 ft. in the Tertiary have been found to be productive. The main producing fields in 1940 were Talang Djimar (discovered in 1937), and Talang Akar-Pendopps. Most of the wells in these fields are between 1,000 and 4,000 ft. deep. These districts are worked by the *B.P.M.* and *N.K.P.M.* There are large refineries near Palembang (see plate 24, vol. 1 of this Handbook).

Java

Oil seepages, which are often associated with mud volcanoes and brine springs containing iodine and natural gas, are of frequent occurrence especially in the eastern half of the island, where several fields are worked, notably in the region of Rembang and Soerabaja. Oil has been produced from shallow Miocene beds in these fields since 1889, and there have been few recent discoveries except at Kawengan. The *B.P.M.* and *N.K.P.M.* work this district; the *N.P.P.M.* also have a concession, in which, however, little exploration has yet been done.

Borneo

Tertiary oil-bearing beds appear to occur only in the eastern half of Borneo and are worked in the Balikpapan basin and on Poelau Tarakan, just off the mouth of the Soengai Sesajap. Oil has recently been found in commercial quantities in the Barito basin.

On Poelau Tarakan oil has been produced since 1907; the crude oil is uniform and makes an excellent fuel oil. A little to the north of P. Tarakan is P. Boenjoe (Tanahmerah) where oil was found in 1923, but this field has not yet been developed.

In the Mahakam basin, in the neighbourhood of Balikpapan, oil is found in the Lower Miocene sandstone in a series of anticlines, the easternmost of which is the only one which has so far proved rich.

The *B.P.M.* and *N.K.P.M.* have exploited both these oil-yielding districts, while the *Borneo Olie Mij.* hold a few concessions near Sangkoelirang bay where oil has been discovered, but so far in small quantities only. The *N.K.P.M.* were carrying out extensive exploration in 1939 in parts of the Kapoeas basin to the west of their Mahakam concessions.

Ceram

At Boela, on the north-eastern coast of the island, an oilfield has been developed since 1914; the bulk of the oil is obtained from Pliocene sands, though some has also been found in the Triassic. The field is worked by the *B.P.M.* and is of considerable significance in view of the proximity of Amboina. Asphalt is obtained from the crude oil and is of importance on account of the increasing number of motor roads in the islands.

Other Islands

Oil is known to occur in New Guinea and Celebes, and also in Portuguese Timor, though it has not so far been found in Dutch Timor.

In Dutch New Guinea the *N.N.G.P.M.* since 1935 has carried out intensive exploration over an area of 38,000 sq. miles. Wells have been drilled at three places, Klamono, Wasian and Mogoi, all in the Vogelkop, and some oil has been discovered.

The *B.P.M.* has carried out exploration in a small area of the central part of the west coast of Celebes where oil seepages are reported to occur in Lower Tertiary or Upper Mesozoic formations. Asphalt deposits are being worked on Poelau Boetoeng off the south-eastern peninsula of Celebes.

Production and Export

The amount of oil produced from the chief fields in 1940 is shown in the following table:

Oil production in 1940

Area	Quantity (thousands of barrels)	Total production in barrels for:
North Sumatra Djambi Palembang	7,484 9,617 22,654	Sumatra 39,755,000
Central Java Eastern Java	5,608 560	Java 6,168,000
Tarakan Balikpapan	5,433 7,089	Borneo 12,522,000
Ceram	664	Ceram 664,000
		Netherlands Indies 59,109,000

Based on official sources.

Characteristics of Crude Oils

Place	Type of crude oil	Specific gravity	Special products
Pladjoe (Sumatra)	light and heavy waxy	0.750–0.950	aviation and motor gasoline
Pangkalanbrandan (Sumatra)	very light waxy	0.750–0.786	aviation gasoline
Soerabaja (Java)	heavy asphaltic	0.800–0.920	asphalt
Tjepoe (Java)	waxy	0.800–0.920	paraffin wax
Balikpapan (Borneo)	waxy	0.847 0.873 0.958	paraffin wax lubricating oils
Tarakan (Borneo)	heavy asphaltic	0.935–0.952	diesel and fuel oil
Boela (Ceram)	heavy non-waxy high sulphur	0.922	asphalt

Based on official sources.

Refineries

Place	Company	Capacity (barrels/day)	Notes
Pangkalanbrandan (N.E. Sumatra)	B.P.M.	19,000	
Pladjoe (S.E. Sumatra)	B.P.M.	45,000	High octane aviation spirit is a speciality.
Soengai Gerong (Pladjoe) (S.E. Sumatra)	N.K.P.M.	45,000	
Tjepoe (Mid Java)	B.P.M.	15,000	Supplies the Java market.
Wonokromo (E. Java)	B.P.M.	2,500	Supplies the Java market
Kapoean (Blora) (Java)	N.K.P.M.	500	
Tarakan (N.E. Borneo)	B.P.M..	—	Dehydration plant only
Balikpapan (E. Borneo)	B.P.M.	42,000	Treats crude oil from Boela also

N.I.A.M. crude oil is treated in *B.P.M.* refineries

Based on official sources

About 4 million tons of oil were exported from the Netherlands Indies in 1940. Much of the oil is exported through Singapore by way of the entrepôt installations on Samboe, Boekoem and Bintan islands; some also goes to the installation on Sebarok island, but this mainly serves British Malaya and the adjacent countries. Singapore is found convenient because the Sumatra oil ports, Pangkalansoesoe and Palembang are unable, owing to the existence of sandbars, to load ocean-going tankers to capacity. The former can load only about 50%, and the latter, even after recent dredging of the Air Moesi, only about 75% of a full cargo; though from Palembang, vessels carrying black oils can be topped up from hulks outside the bar. Moreover, Singapore is situated centrally, not only for the Sumatra ports but also for Miri (in Sarawak), and the products of two or more different refineries can be blended there, or mixed cargoes from different refineries can be shipped. Also it often saves valuable time to load an ocean-going tanker at Singapore only.

TIN

The largest tin-producing area in the world extends through the Malay Peninsula from the southern extremity of Burma and Siam, the Riouw and Lingga archipelagoes, to Bangka and Billiton; it extends into eastern Sumatra and reappears beyond the Barisan ranges at a few localities on the west coast. The only other area comparable in importance is in Bolivia. Formerly the Netherlands Indies ranked third among tin-producing countries after British Malaya and Bolivia, but since 1936 they have gone ahead of the latter country and taken the second place. Before the economic crisis of 1929 their share of the world output was about 18%; since then production has been governed by the policy of restriction (see p. 308).

Occurrence

The ore of tin is cassiterite (SnO_2) which only occurs *in situ* in veins or lodes the mineralization of which is genetically related to the formation and cooling of granite and allied rocks. In all probability the tin, in combination with fluorine and boron, was derived from acid igneous magma; by interaction with water vapour the metal was deposited as tin oxide, while the fluorine and boron thus released contributed to the formation of topaz and tourmaline, which are very common associates of cassiterite. Cassiterite possesses physical and chemical properties which enable it to withstand weathering processes

to such a degree that it remains unaltered throughout geological ages: it is virtually indestructible. Accordingly, when the veins and lodes are exposed to erosion, the cassiterite is washed down by rivers and accumulates, by reason of its high density, in gravel deposits, whence it can be extracted by digging or dredging. Not unnaturally these gravels extend beyond river mouths under the sea, and 'sea-tin' is of some importance, though not so much in the Netherlands Indies as at Singapore.

The occurrence of tin in Malaya and the Netherlands Indies may thus be ascribed to two events in the geological history of the region: first the Triassic earth-movements during which the granite masses were formed and the tin ores deposited in veins and lodes, and secondly the Pleistocene changes in sea level, which materially assisted the accumulation of vast alluvial deposits in and around the islands (see vol. 1, pp. 8, 126-7 of this Handbook).

The tin gravels are not, however, inexhaustible. One large dredger can remove more cassiterite in a day than would accumulate in a generation, and it follows that to an increasing extent the original sources—the veins and lodes—will have to be sought. Such primary sources have already been located in Bangka and Billiton, and are being worked; of recent years about 20% of the output from Billiton has come from deep mines.

Many of the alluvial fields are of considerable size, covering the whole width of river beds and extending for ten miles or more. The cassiterite is in general rich and easily workable, producing a metal of particularly good quality, which fetches a premium over 'standard' tin. There is, however, very little wolfram (ore of tungsten), elsewhere often found in association with tin, and until recently the total annual production of wolfram was less than a ton, but in 1939 it rose to 3,500 tons.

History

Tin was discovered in Bangka in 1710, and in 1722 the Dutch acquired from the sultan of Palembang a monopoly of all the tin produced in that island which was then subordinate to Palembang. Not until 1812, however, when Raffles annexed Bangka, was there any attempt to supervise production. With the restoration of Dutch rule in 1816 the mines on Bangka became the property of the Netherlands Indies government, but little attempt was made to develop them. Although mining engineers were appointed in 1853 the mines were still worked by coolies, almost exclusively Chinese,

on primitive lines, and only in 1890 was steam power introduced. With the gradual exhaustion of the surface deposits more elaborate methods of production were found necessary, and since the war of 1914-18 hydraulic pumps and large dredgers have been used.

Work on the fields in Billiton dates from 1852, when a small group of capitalists, urged on by Prince Hendrik, a brother of the king, obtained a concession entitling them for a period of forty years to exploit all ore deposits found on that island. As their funds proved insufficient they formed the Billiton Co. Ltd. in 1860 with a capital of f 5 millions to take over the concession. In 1924 the legislature sanctioned the formation of the Joint Mining Co. Billiton (*Gemeenschappelijke Mijnbouw Maatschappij Billiton*, often known as *G.M.B.*), with a capital of f 16 million, of which f 10 million was allotted to the government and f 6 million to the former Billiton Co. In 1933 the Billiton Co. bought up the other large tin enterprise, the Singkep Tin Co. This was followed in 1937 by a proposal to bring all the tin interests under a central control by the amalgamation of the Bangka and Billiton concerns. The necessary legislation was passed, but the project was abandoned or suspended in 1941 owing to the outbreak of war.

The Singkep Tin Co. was founded in 1887 to work a concession granted to it in that island by the sultan of Lingga. This proved unprofitable, but prospects improved in 1907, when the company obtained a concession from the Dutch government to work 'sea-tin'. In 1933 all the interests of the company were taken over by the Billiton group, which formed for this purpose a new company, the *Singkep Tin Exploitatie Mij.* (S.I.T.E.M.).

Mining

Since most of the tin is alluvial, the essential process in winning it consists in washing away the dirt from the tin ore. Ordinarily alluvial tin is found in layers which may be many feet below the surface, and the first stage was done by manual labour, almost exclusively Chinese. The earliest step towards mechanisation was the introduction of the gravel pump in Billiton in 1910; with this pump water could be directed over the working face, but manual labour was still needed to break up the soil. Then came the introduction of monitors, which broke up the soil with a powerful jet of water. A further stage was reached in 1920 with the use of bucket dredgers, which make it possible to dispense almost entirely with unskilled labour. The new dredgers include facilities for washing the ore mechanically on jigs and concentrating tables. A dredge run by 150 men working in three

eight-hour shifts can move as much material as formerly required four or five thousand labourers. The latest dredger at Billiton has a pontoon measuring 246×75.5 ft., and can dredge to a depth of 98 ft.; it can move 106 million cu. ft. of dirt annually. Billiton and Sinkep have at their joint disposal eighteen bucket dredgers and three hydraulic monitors, and Bangka owns ten bucket dredgers (Plate 51).

In Billiton some of the ore is found in veins and must be won by mining; in one mine the tin is worked at a depth of 984 ft.

Production

Until 1933 a small proportion of the ore was smelted in Bangka in modernized charcoal furnaces, but most of it was sent to Singapore for smelting by two British companies. Since then, however, much of the ore has been sent to a new smelter at Arnhem in the Netherlands belonging to the Holland Metallurgical Works, which claims to have the most efficient smelting plant in the world. In this company the G.B.M. is a shareholder. Recently it has been linked up with the Consolidated Tin Smelters Ltd. with plants at Liverpool and Penang. Some ore, however, is still treated in Bangka.

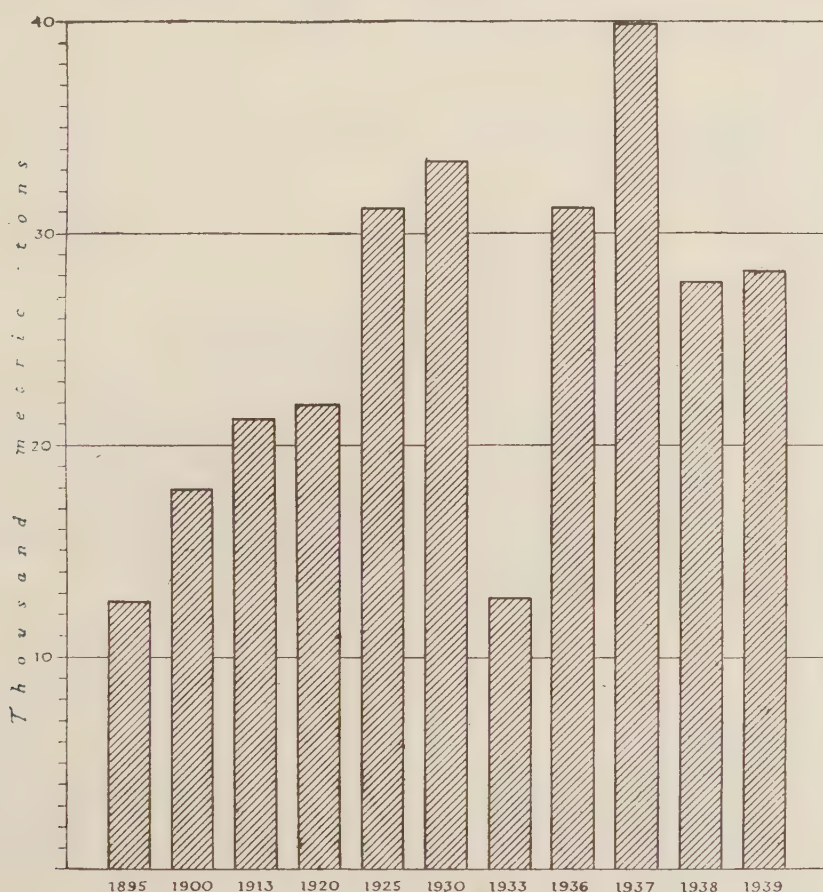


Fig. 57. Growth of tin production

Source: *Indisch Verslag*, 1938, vol. II, p. 287 (Batavia, 1938).

The improved methods of production since the war of 1914-18 are reflected in the greatly increased output. Up to 1913 there was a gradual rise, but after the war production increased so rapidly that in 1930 it was practically double that in 1900. To the production in 1930 the Bangka Co. contributed 21,943 tons; the Billiton Co., 10,786 tons; the Singkep Co., 1,162 tons, and the two smaller companies only just over a thousand tons together. Meanwhile world production had been growing more rapidly than consumption. There was a glut of tin, and the fall in prices consequent on the crisis of 1929 was therefore disastrous. In the Netherlands Indies, however, the mines were in a strong position. The G.M.B. since its foundation has adopted the policy of building up a strong reserve, enabling it to pay dividends in bad years. Since 1932 a similar policy has been adopted in the Bangka mines, with a view to stabilising the revenue from this source at f 15 millions and maintaining a reserve of f 35 millions. Thus, during the depression, the mines were able to buy costly machinery at favourable prices, and thereby effect further economies in production. By 1937 the position had so far recovered that the output reached a maximum of close on 40 thousand tons, but subsequently declined. In 1937 Bangka produced 23,476 tons, Billiton, 13,891 tons, and Singkep 2,365 tons; the native production in that year was only 14 tons. The total output in 1940 was 44,563 tons.

OTHER MINERALS

Bauxite

Some islands in the Riouw archipelago have been found to contain bauxite, the ore of aluminium. It has been worked since 1935 by the Netherlands Indies Bauxite Exploitation Co. The main field is in Bintan, but it extends into the neighbouring islands, which have been linked up with Bintan by a cable bridge (Plate 52). The ore is worked on scientific lines with a modern washing apparatus and a rotary oven for drying. The product is stored in warehouses with a capacity of 22,000 tons, and is transferred to the ships by machinery. In 1938 the quantity exported was 273,877 tons.

Coal

Coal is widely distributed and the total resources have been estimated at five to six thousand million tons. But much of this is at present inaccessible and the quality is in general inferior. It is of Tertiary age, and has a large percentage of moisture and gas, which

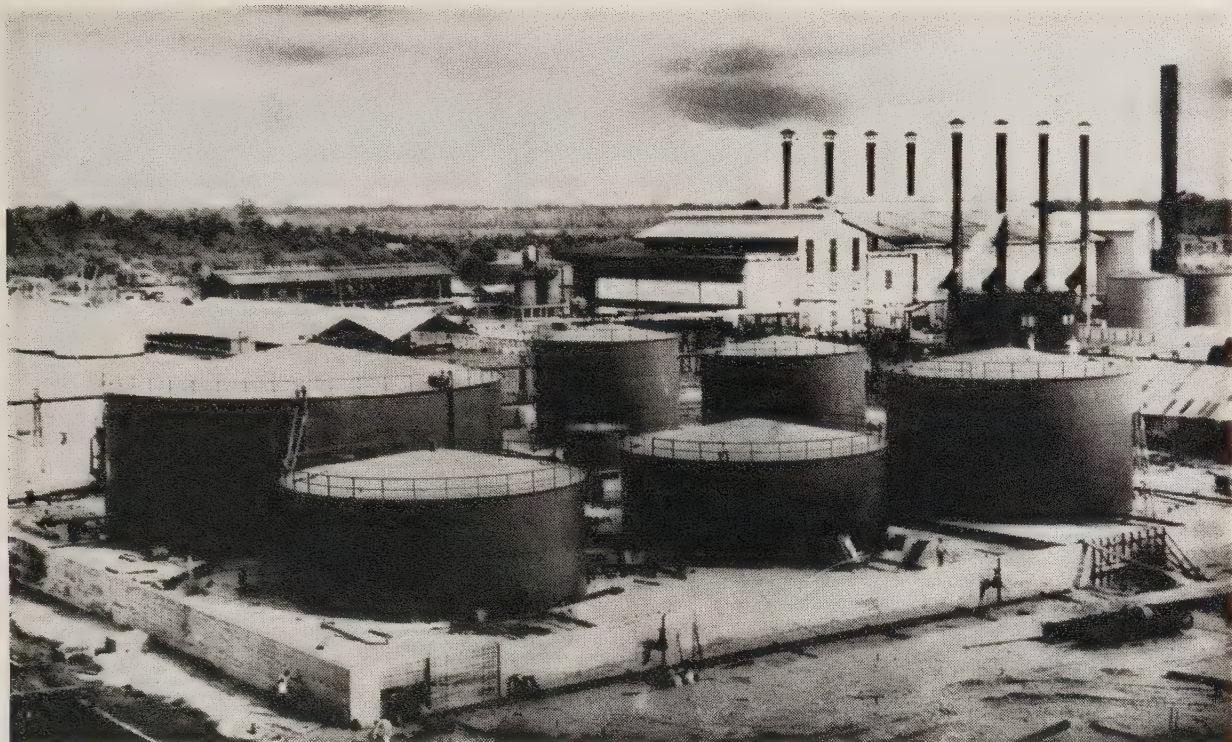


Plate 50. Tank park, Pladjoe

The oil installations at Pladjoe are the most important in the Netherlands Indies. The refinery (see Plate 84) has a capacity of 45,000 barrels a day.

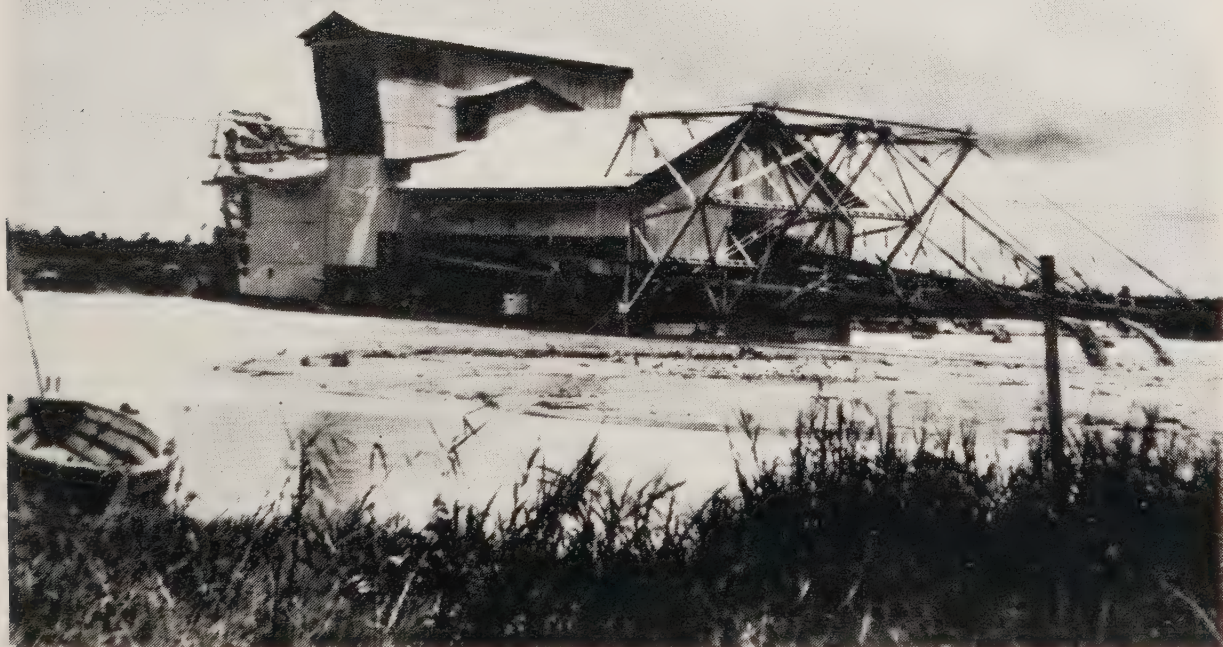


Plate 51. Bucket dredger, Billiton

This dredger is used in the mining of tin from alluvial beds, its chief function being to wash away the dirt from the tin ore.



Plate 52. Bauxite mine on Bintan island



Plate 53. Pit head at Sawahloento in the Oembilin coalfield, Sumatra

renders it friable and apt to take fire spontaneously, so that its employment for steam-raising entails the use of specially constructed boilers. By compression into briquettes, however, it can be used on the railways and in steamships, and the fact that it lies near the surface reduces the cost of working, though this is counterbalanced by the high cost of transportation.

The chief fields are in Sumatra and Borneo. In Sumatra the mines at Oembilin near Padang and at Boekit Asem near Moearaenim are worked by the government (Plate 53); the State colliery in Poelau Laoet off Borneo has been closed since 1931. The total output of the State mines in 1939 was 1,222,000 tons. The private collieries, now only five though formerly more numerous, are all situated in south-east Borneo; the most important are Rantaupadjang and the East Borneo colliery which together account for nearly nine-tenths of the coal produced. The total output from these private collieries in 1939 was 532,000 tons. Until recently natives worked coal by primitive methods in Palembang and in west and south-east Borneo, but they have now stopped work in the two former centres.

When the mineral resources of the colony were first thrown open to the public in 1851, steam transport was just beginning to attract attention, and one of the earliest enterprises was an application for a coal concession in 1852. But this was premature, and subsequent attempts to exploit the fields in Borneo came to a tragic end with a massacre of the Europeans in Bandjermasin in 1859. The construction of railways from 1867 and the growth of steam shipping after the opening of the Suez Canal in 1869 made the demand for coal more urgent. Coal was discovered opportunely at Sawahloento, in the Oembilin valley, in 1868, but, as private capital was not attracted, the government began operations there in 1891. It opened other fields in Poelau Laoet in 1905 and at Boekit Asem in 1918. Private enterprise continued to show little interest, and in 1913 the total output from private mines was less than 10 thousand tons. The war of 1914-18 stimulated production, which rose rapidly to over 100 thousand tons in 1918 and to over 700 thousand by 1929. The output fell off during the depression, and in 1933 dropped to 375,000 tons. Since then it has risen again, as noticed above.

The Oembilin field (see vol. 1, p. 63 and Figs. 37, 38, 56 of this Handbook), roughly 6.2×5.6 miles, contains three seams, averaging from 6.9 to 23.3 ft. thick; the total reserve is estimated at 209 million tons. In the Poelau Laoet field there are two seams of which only one, about 6.6 ft. thick, has been worked. The Boekit Asem field (see

vol. 1, Fig. 47, of this Handbook) has four seams of which only the upper three are worked. The top seam consists of two banks of 19·7 ft. and 23 ft., separated by some 13–16·5 ft. of tufa; the next seam consists of two banks of 19·7 ft. and 9·8 ft. separated by 6·6 ft. of clay slate; the third seam is 16·5–19·7 ft. thick. The top seam is 65·6 ft. above the second, and this 82 ft. above the third; the fourth seam is about 328 ft. lower. The Boekit Asem coals have a higher calorific value than most Tertiary lignites, owing to their having been more or less baked by the heat of volcanic activity (see vol. 1, p. 83 of this Handbook).

Mining with vertical shafts is found only in Boekit Asem and in the private colliery at Rantaupadjang; the Oembilin field is worked from adits.

The transport of the coal to centres of consumption is naturally a major problem. The Borneo mines, and especially Poelau Laoet, have the advantage of being near the coast. The Boekit Asem coal must be transported by rail before shipment at Palembang, but can stand the high cost of transport by its superior quality. The Oembilin coal must be carried about 100 miles by rail to Emmahaven, the port of Padang, and then shipped to Sabang or ports in Java before it can be sold. Largely owing to the high cost of transport, the State mines have been working at a loss since 1925 or earlier. It is only when outside supplies are cut off, as by war, that the mines can be directly profitable; but they contribute indirectly to the wealth of the colony by guaranteeing a regular supply of fuel for steam transport by rail or sea. The coal from Boekit Asem is compressed into briquettes, which make excellent fuel not only for the State railways but also for warships. The Oembilin coal is used as dust in the manufacture of Portland cement at Padang, but is chiefly used in specially constructed boilers by local shipping.

Diamonds

Diamonds are found in sand and gravel deposits in river beds in Borneo. During the early years of this century there seems to have been considerable activity, which subsequently declined; but the operations were confined to Chinese and natives and the figures for output must be accepted with reserve. A company, the *Mij. tot Mijn-Bosch-en Landbouw Exploitatie*, obtained a concession for washing diamonds in Langkat, but it ceased operations in 1935. In that year it obtained 3,273 carats valued at f 54,504. Native workings yield less than a thousand carats, with a value of f 10 to 20 thousand.

Gold and Silver

Gold and silver are more important in legend than in fact, but from very early times Chinese miners have worked the deposits by primitive methods. Towards the end of last century there was a speculative boom which soon collapsed, leaving a few companies that worked on sound principles.

The chief centres are near the west coast of Sumatra, in the Manado peninsula in Celebes, and in Borneo. The gold occurs both in veins and in alluvial deposits, but the big concerns work exclusively on lode ore; dredging and the washing of gravel deposits have had little success.

Output of Gold and Silver (kg.)

Year	Gold	Silver
1900	428	2,292
1913	3,866	17,212
1925	4,147	75,172
1937	1,730	15,555

Source: *Statistical Abstract*, 1940, Table 78

Silver is found only in association with gold, and chiefly in manganese-silver ores. Formerly the government worked a field at Tambang Sawah in Sumatra, but this was closed in 1931 as being exhausted. In 1937 six companies were working in Sumatra, one in Celebes, and two in Borneo; Chinese and native workings in river gravels were confined to Borneo.

Iodine

Springs containing iodine are found in Soerabaja, Semarang and Rembang Residencies of Java. At one time there were four or more companies engaged in working this product, but in 1937 there were only two. The product is obtained in the form of copper iodide, and the total yield varies from 100 to 200 tons.

Iron

In many parts of the Netherlands Indies there are indications of iron-ore, notably in south-east Celebes, south-east Borneo and the Moluccas, where the available supplies are estimated at upwards of 500 million tons. Owing to the high cost of transport, extraction has not hitherto been feasible, and even the proximity of coal in south-east Borneo is unlikely to lead to a smelting industry, for it is

improbable that Tertiary lignite could be made to yield metallurgical coke.

Manganese

This was one of the first minerals to be exploited on modern lines. It is found in the Jogjakarta and Preanger districts of Java. Extraction began in 1894, and in 1897 the output exceeded 5,000 tons. In the succeeding years the output rose gradually and just before the economic crisis of 1929 was more than 20,000 tons. The Preanger ore is of poor quality and cannot stand severe competition or high freights, and prospects are discouraging. Practically all the ore is won on the concessions of the General Industrial Mining and Exploitation Co.; but there is a small privately-owned concession in the Djember district that yields a few score tons under favourable conditions.

Phosphates

Deposits of phosphates are worked in Java. This is a recent development carried on by the *Exploitatie en Handel Mij. voorheen F. Buning*, the chief firm in the business, with works in Cheribon. Another firm working phosphates is the General Industrial Mining and Exploitation Co., with a concession in Karangbolong. A considerable output has been obtained recently under prospecting licences in the Residencies of Buitenzorg, Cheribon, Bodjonegoro and Djapara-Rembang. In 1937 the total production was 26,167 tons.

Sulphur

Sulphur is largely used in Java for the refining of sugar. It is found in numerous volcanic craters, but especially at Kawah Poetih (= 'white crater') in Preanger, where it was at one time worked by the General Industrial Mining and Exploitation Co. This firm had to close down in 1931, owing to the collapse of sugar, but a contract with the government enabled the sulphur-works (Kawah Poetih Co.) to resume work in the old field. In 1937 the output was 9,048 tons of refined sulphur, 1,696 tons of sulphur powder, and 1,456 tons of mother-of-sulphur. A few hundred tons of sulphur are also won by the natives in the crater of Goenoeng Welirang, in eastern Java. The chief market is in Java and the Outer Provinces, but some is exported to India, the Persian Gulf and South Africa.

Salt

In most oriental countries salt is an important source of revenue, and the manufacture and taxation of salt at the beginning of the

Christian era is mentioned in the earliest historical reference to Java. The general principles that have guided salt administration in recent years are that imports should be restricted to fine table-salt and other special market varieties; that, apart from certain localities, manufacture should be prohibited except under licence from the government; that, so far as expedient, the manufacture and sale should be conducted solely by the government, with a view to supplying good salt on moderate terms and to making as much revenue as possible without discouraging consumption. The monopoly applied originally only to Java and Madoera, but has gradually been extended over the Outer Provinces. Formerly the manufacture was widely distributed, but since 1870 it has been practically restricted to Madoera (see vol. I, pp. 196-7 of this Handbook). Almost all the salt comes from six coastal salt-pan areas, of which five are in Madoera and one on the adjacent mainland at Grisse; there are two large factories in Madoera for making and packing the briquettes. From these the salt is distributed to local agencies over the whole area covered by the monopoly. Salt is also manufactured for private sale on a few native fields of comparatively small importance; almost all these are in the Outer Provinces.

The process of manufacture is simple. Sea water is first led into the highest field in each holding. Thence it passes at intervals of a few days to lower fields, and the brine gradually becomes more concentrated by evaporation. Finally it reaches the crystallization pan where it is allowed to stand for twenty days. The salt is then spread out on a mat of split bamboo, washed and left for ten days to drain. When the salt is dry, the owner obtains from the field manager, who watches the operations on behalf of the government, a Transport Pass, for taking the salt to be stacked. Each man then piles his salt in a separate heap round the entrance to a palisaded square. Here it is transferred to standard measures, and the owner is credited with the amount received. Within the palisade the standard measures are poured out and built up into a high stack which, with coolies of both sexes continually running up and down, looks rather like a colossal anthill built of salt. From these stacks it is transferred into warehouses, formerly of timber with thatched roofs, but now mainly of galvanised steel. In the warehouses the salt is stacked for at least four years, during which there is a normal reduction by drying of 10 to 13%.

At the end of about four years the salt is ready for transfer to the compression factory. It is first separated from the remaining mother liquor in centrifuges and then falls through semi-automatic funnels

into the press. The pressed blocks are then dried in an oven and passed on to the packing department. From the despatch godowns the salt for Java is loaded on to trucks of the Madoera Steam Tramway, and that for export is sent by a light railway, owned by the factory, to the local wharf.

The following table shows the production during recent years.

Salt Production (m. tons)	1929	1934	1936
<i>State Production</i>			
(a) State land	82·8	12·7	10·8
(b) Private land	404·1	69·7	80·4
State imports	·5	—	—
<i>Private Production</i>	27·2	10·8	16·2
Total	514·6	93·2	107·4

Source: *Statistical Abstract*, 1940, Table 77.

It fell off sharply during the depression but was beginning to recover in 1936. In 1937, however, the State took over the native salt-pans in Madoera, and work was temporarily stopped on the largest fields, with a view to reorganization. The total consumption of salt-reached a high level between 1928 and 1930 when it exceeded 200 thousand tons a year. Of this rather less than 30 thousand was taken for fish-curing and industry. In 1934, the consumption fell to 154,485 tons, but since then has gradually recovered.

BIBLIOGRAPHICAL NOTE

A general account of the mineral resources of the Netherlands Indies is given in C. G. S. Sandberg, 'The Mines and Minerals in the Netherlands East Indies Archipelago' *Asiatic Review*, vol. xxvi, pp. 28-36, 243-56 (London, 1930), and in H. Foster Bain, *Ores and Industry in the Far East* (New York, 1933). The regulations controlling mining and its administration are described by P. Kleintjes in the two volumes of *Staatsinstellingen van Nederlandsch-Indië* (s' Gravenhage, 1931).

Chapter IX

INDUSTRY

Native Industries: European Industries: Power: Bibliographical Note

NATIVE INDUSTRIES

At one time, native agriculture and native industry provided for almost all the requirements of the people. Their wants were very simple and were satisfied by the manufacture of silk and cotton garments and the fashioning of weapons, tools and jewellery. During the nineteenth century, imported manufactures ousted local products and native activities were increasingly restricted to agriculture.

The war of 1914-18 and the world economic depression both caused a great reduction in imported manufactures and helped to bring about a revival of native industry, both in the home and in small, government-sponsored factories. These native industries are mainly domestic and are practised on a small scale in the intervals of work in the fields; the majority are to be found in every village and supply most of the native requirements in clothing, foodstuffs, houses and furniture. With a native population of about sixty million these industries, though individually insignificant, are of considerable importance from a quantitative point of view. The methods employed have, in general, changed little since before the arrival of the Europeans and the products vary in quality according to the skill of individual craftsmen. Only a few commodities manufactured by natives are exported, or are otherwise of more than local importance. The chief among these are batik, cigarettes, and hats.

Batik

The batik industry is centred in Midden-Java, though it is now carried on in other parts of Java and also in parts of Celebes and Sumatra. It is typically a home industry, though small factories have been established by the government. In spite of this tendency towards large-scale manufacture, factories with over eighty workers produce no more than 8% of the total output of batik.

The process is one of making coloured patterns on cloth which is

either imported or manufactured in European factories in Java. The fabric to be treated is first washed and then heated in rice water, sometimes mixed with lime or bamboo leaves, in order to prevent the wax penetrating too deeply. It is then hung up on a rack, the pattern is drawn on it with charcoal, and all the parts which are not to be



Fig. 58. Batik-working in Java

Batik-working is a method of producing coloured designs on cloth (Plates 54, 55). Representations of plants, birds or butterflies usually form part of the complex designs.

Based on a photograph.

coloured with the first dye are coated with a mixture of beeswax and a little resin. The wax is heated in an iron pan on a chafing dish with glowing charcoal and is applied to the cloth by means of a *tjanting*, a brass vessel with one to four fine spouts. Both sides of the cloth are treated in the same manner and, when the wax has hardened, the fabric is immersed in a vat of indigo. When the dyeing in indigo is finished the fabric is washed, the wax removed from the parts which are to take the second dye and the remainder covered with wax. For the second dyeing a reddish-brown colour called *soga* is used and occasionally other colours are added later. The whole process takes fifteen days for the best quality batik, though an inferior type can be produced in a shorter time (Plates 54, 55).

Cigarettes

The manufacture of native straw cigarettes increased rapidly between 1933 and 1937, the value of the output rising from about



Plates 54 and 55. Ancient Javanese batik work



Plate 56. Portland cement factory at Indaroeng near Padang

This is a government-owned factory with an output of over 200,000 tons of cement a year. The aerial ropeway runs to Boekit Poetoes, on the railway near Emmahaven (see p. 438).



Plate 57. Sisal factory, Soekamandi

f 1 million to nearly f 9 million. The industry is carried on in small factories as well as in the home. Early in 1942 there were sixty-nine of these factories, sixty-five of which were in Midden- and Oost-Java. The cigarettes are all hand-rolled and are flavoured with cloves or scented with various vegetable products.

Hats

Hats are made from plaits of *pandan* (*Pandanus*) leaf or bamboo. The plaits are shaped by means of a special plank with a circular hole which fits the crown of the hat, and stitched to each other. The material may be coloured before plaiting by boiling with vegetable extract or aniline dyes. The main centre of hat making for export is Tangerang in the Residency of Batavia, where the industry is under the direction of a French firm. Other centres of lesser importance are in the Bantam and Preanger Residencies.

EUROPEAN INDUSTRIES

The nineteenth century saw the beginning of European industry in the Netherlands Indies, notably in sugar factories, rice mills and other enterprises concerned with the preparation of agricultural produce for both the home and foreign markets. At the end of the century when the 'diminishing welfare' of the people of Java became a matter of general concern, it was thought that greater industrial development might bring about an improvement in their economic position. The speed with which industrialisation has proceeded has depended greatly on economic conditions. Little was attempted during the prosperous years before 1914, but interest revived during the war of 1914-18 when the Netherlands Indies had to produce many goods previously imported. With the restoration of normal conditions, industry was again neglected until the loss of foreign markets and the consequent inability to import manufactured goods during the economic depression of 1930-37 forced the government to encourage industry more actively than ever before.

The World Economic Depression (1930-37)

The first effects of the depression were so severe that the whole economic system threatened to collapse; temporary adjustments were made in an attempt to keep the existing system working. Towards the end of 1931, the yen was devalued and Japanese imports flooded the market to such an extent that the government was compelled to abandon the tradition of economic freedom and to take

steps for the protection of Dutch interests. This was followed by a more fundamental readjustment of economic life when it was realized that many of the new features were permanent.

European industry at first received a severe set-back, but soon the lack of opportunity for investment and the fall in wages stimulated the establishment of new industries; these aimed primarily at replacing imports which were no longer available, notably beer, biscuits, chocolates, cigarettes and mineral waters. Japanese imports threatened the existence of these newly established industries, until the government adopted a policy of restricting the import of certain commodities. This assurance of government support and protection led not only to a further development of local industry, but also to the establishment of new factories in the Netherlands Indies by foreign firms which took advantage of the cheap labour available, and at the same time saved on freight charges and import duties. This new industrial development was so keenly competitive that the government passed an Ordinance for the Regulation of Industry in 1934, which made an official permit necessary for the establishment of new enterprises or the expansion of old ones.

Processing of Agricultural Produce

Sugar

Sugar-growing is carried on mainly in Oost-Java and to a lesser extent in Midden-Java (see p. 190 and Fig. 37). With few exceptions, each estate has its own factory; in 1937 there were forty-four factories working in Oost-Java, fourteen in Midden-Java, and six in the Cheribon Residency of West-Java, making a total of sixty-four. The number of factories and estates declined rapidly between 1931 and 1934, as a result of the economic crisis and the restrictions on export imposed by the government (see p. 311). In 1931 there were 178 estates with factories and sixteen without; by 1937 only three estates without factories remained. The largest sugar factory is that at Djatirotto near Loemadjang in the plains south of the Ijang-gebergte, where the cane is brought in from the surrounding estate by an extensive Decauville railway system. At the time of the cane harvest or 'campaign' the sugar industry gives employment to about a million native workers.

Rice

Since rice is the most important single foodstuff for the native population and occupies a large part of the cultivated area in Java (see

p. 182 and Fig. 33), mills for husking the grain are very numerous. At the time of the Japanese invasion in 1941 there were 1,040 rice mills in operation and these employed nearly 27,000 workers.

Cassava

Cassava products—tapioca, manioc meal, flour and factory waste—are manufactured both in factories and on a small scale by natives. The output from the factories is of considerable importance in the export market, but the native product is of a low grade and is for local consumption.

There are about two hundred factories engaged in the industry; their distribution is shown in the following table:

	<i>Tapioca factories</i>
West-Java	130
Midden-Java	53
Oost-Java	35
Sumatra	2
	<hr/>
Total	220
	<hr/>

Only three of these factories are large. The chief products in 1941 were about 165,500 tons of tapioca flour and 34,500 tons of manioc meal. The other cassava products were manufactured on a smaller, though still considerable, scale. The industry employs about 7,500 workers.

Foodstuffs and beverages

Dairy Produce

There is a considerable dairy industry in Java, where there are thirty-five factories turning out butter, cheese, cream, buttermilk and yoghurt. The majority of the factories are in West-Java, where there are thirteen, though the factory at Bandoeng is the only really large one. There is in addition a great production by small enterprises.

Chocolate and Confectionery

There is a large chocolate factory at Soerabaja and two other confectionery factories which are also large. There are in addition twenty-one other factories producing confectionery in Java and a great production by small firms. The number of workers employed in the twenty-four factories was about two thousand in 1941.

Ice

Nearly every town in the Netherlands Indies has an ice factory, and in 1941 the total production was 240,031 tons. In the same year

nearly 2,500 people were employed in the ice factories; the distribution of these factories is shown in the following table:

	<i>Ice factories</i>
West-Java	34
Midden-Java	37
Oost-Java	39
Sumatra	63
Borneo	22
Groote Oost	34
Total	<hr/> 229 <hr/>

A number of ice factories also manufacture mineral waters as an integral part of their business.

Beer and Alcohol

There are two large breweries in Batavia and Soerabaja and five smaller establishments also in Java, which produce other alcoholic beverages. There are in addition three large factories and one small one which produce 95% alcohol. One of these is equipped for the production of absolute alcohol.

Miscellaneous Foodstuffs

Bread, biscuits and pastry are made in over one hundred factories scattered throughout the islands, and there are in addition numerous small enterprises. Six factories in Java manufacture preserved food, the chief kinds being vegetables, fruit, meat, fish, jam and soup. The output was a little over one thousand tons a year, but the production by small concerns was a hundred times as great.

Textiles

Cotton Spinning and Weaving

The largest spinning centres are Semarang and Tegal—the former has 18,000 spindles and the latter 15,000. Another spinning mill was in course of construction in 1941 at Demak.

There are altogether two hundred weaving factories, the bulk of which are in Java:

	<i>Weaving factories</i>
West-Java	86
Midden-Java	62
Oost-Java	44
Sumatra	5
Groote Oost	3
	<hr/> 200 <hr/>

At Tegal there are about 10,000 hand looms and weaving is largely a cottage industry built up around a central factory organization. The other large factory, at Garoet, has 1,200 mechanical looms and produced in 1937 over sixteen million square yards of low grade cotton fabric. The two hundred factories have altogether about 9,700 mechanical looms and 23,400 hand looms and employ over 50,000 workers.

Heavy Textiles

Heavy textiles, including ten million gunny-bags, are manufactured in five factories in Java. Two large factories use rosella almost exclusively, while jute and sisal are also used in the others. All the fibres, except for cotton yarns, are grown in the Netherlands Indies. Rather over three thousand workers are employed (Plate 57).

Ready-made Clothing

Nine factories, all in Java, employ about two thousand workers and use imported cotton fabrics. Small enterprises, which employ about 90,000 workers, make a more important contribution to output than the larger concerns, as in many industries in the Netherlands Indies.

Oils

Vegetable Oils

Many of the factories for the extraction of oil from copra, peanuts and other seeds are attached to the plantations where the crops are grown. There are, however, a certain number of independent factories which buy the oil seeds mainly from the native grower. There are in addition three margarine factories. There are over a hundred factories dealing with vegetable oils, the great majority of which are in Java; about seven thousand workers are employed.

Essential Oils

The manufacture of essential oils, though not a large industry, is of importance because a considerable proportion of the world supply of citronella oil is provided by the Netherlands Indies. There are 528 factories engaged in the industry, but these are generally small-scale concerns. All but seventeen of the factories are in West-Java. The production of citronella oil in 1941 was about 2,500 tons; 1,100 tons of this came from the factories and the remaining 1,400 tons from small producers.

Rubber

The most important of the rubber firms in the Netherlands Indies is the Goodyear Tyre and Rubber Co., Ltd., with branches at Weltevreden, Soerabaja and Semarang. It has a capacity of 144,000 to 216,000 motor tyres, 360,000 tubes and 3,000,000 bicycle tyres per year. The remaining fourteen factories, seven of which are in West-Java, are on a smaller scale and manufacture rubber shoes and hose-pipe, as well as small quantities of other products.

Chemicals

The chemical industry is on a small scale and of local importance only.

Quinine is extracted from cinchona bark at the Bandoeng factory, which was founded in 1896. The output of the factory in 1937 was about 400,000 lb. of quinine.

Opium, which is a government monopoly, is manufactured at a factory in Batavia.

Sulphuric acid is manufactured in four plants, the one at Balikpapan being associated with the oil refinery.

Oxygen, nitrogen, carbon dioxide and other gases are manufactured at six factories in Java and one in Sumatra. The three largest are at Tandjoengpriok, Bandoeng and Soerabaja. The total output in 1941 was 1,674 tons.

Cement is manufactured in sixty-two factories which employ nearly six thousand workers. The largest factory for Portland Cement is at Indaroeng near Padang. This is government-owned and had an annual output of nearly 215,000 tons in the years immediately preceding the Japanese invasion in 1941 (Plate 56).

Engineering

Railway Repair Shops

There is a total of twenty-three railway repair shops with about six thousand employees. Details of these are given in Chapter xv.

Machinery

There is a considerable production of agricultural machinery, bridges, and other engineering works, particularly in Java, and to a lesser extent in Sumatra and Borneo. Over ten thousand workers are employed in sixty-eight factories. There are also six factories making metal drums all but one of which are incorporated in refineries or rubber factories.

Shipbuilding

There are two large shipbuilding firms, one in Soerabaja and the other at Tandjoengpriok. These have in recent years produced small vessels for the *Koninklijke Paketvaart Mij.* for use in the inter-island trade. There are fourteen other firms which build smaller craft and, together with the two large ones, undertake repairs.

Miscellaneous Industries

Though most of the brick-making in the Netherlands Indies is on a small scale, there are a number of factories in Java and Sumatra which produce both machine-made and hand-made bricks and tiles. There are six potteries, all in the western half of Java, which supplement the large production by natives (Plate 58). There is a government paper factory at Padalarang. The considerable native production of cigarettes is supplemented by that of a number of small factories and three large ones at Malang, Cheribon, and Soerabaja.

Among the more important of the miscellaneous industries is the manufacture of cases, barrels, furniture and other wooden articles. The timber for this industry is supplied by over a hundred sawmills. The sawmills and factories using wood employ more than eight thousand workers.

In the leather industry, there are nineteen tanneries with mechanical equipment, as well as many small unmechanized ones. Six firms in Java are concerned in the manufacture of purses, bags, trunks and saddles; a further ten factories produce footwear. These firms employ nearly three thousand workers and there are in addition about ten thousand people in small establishments.

Java is well supplied with printing offices which undertake all types of work:

	<i>Printing offices</i>
West-Java	91
Midden-Java	72
Oost-Java	63
Sumatra	45
Borneo	3
Groote Oost	10
	<hr/>
Total	284
	<hr/>

These works employ over fifteen thousand workers.

POWER

Steam Power

The substitution of mechanical for manual production in the Netherlands Indies was retarded by the abundance of cheap labour, but during the last half of the nineteenth century the steam engine came into general use in the sugar factories. The progress in the use of steam power during the present century is illustrated in the table, which gives figures for the number of boilers used in private industry, excluding ships, locomotives, and government enterprises.

No. of Boilers used in Factories

Year	Java		Outer Provinces
	Sugar	Others	
1900	1,125	794	837
1910	1,291	1,284	804
1920	1,298	1,905	1,307
1930	1,307	2,755	2,410
1937	672	1,975	1,806

Based on official sources.

This table serves as an index to the growth of industrialization during the present century, until checked by the economic depression (1930-37), and it shows the rapid development of the Outer Provinces. In considering the figures, however, it should be remembered that since the war of 1914-18 there has been an increasing use of petrol engines and of water-power and electricity, so that the actual progress in the use of power has been far greater than they indicate.

Electric Power

It has been estimated that about six and a half million horse-power is available from the waters of the Netherlands Indies. This is very unevenly distributed, and in Java, where most power is needed, there is little more than half a million, whereas Sumatra and Borneo each have about two million, Celebes about one million and the remaining islands altogether about one million. In these circumstances the conservation of water power in Java is a matter of importance and the government has taken into its own hands the exploration, survey and development of this source of power. For this purpose a special section of the Public Works Department was constituted in 1917 to deal with water power and electricity. The general policy of the

government is to reserve as much power as is necessary for general lighting, railways and other public services, and to place the surplus at the disposal of private enterprise. A survey of water power is maintained, with numerous observation stations in Java and some in Sumatra and Celebes.

Permits for small waterworks of less than 100 h.p. and of a temporary character may be obtained from the Public Works Department; concessions with a larger horse-power capacity require an application to the Governor-General, and usually run for forty years. Electricity licences for public utilities are granted for a fixed period not exceeding forty years; licences for industrial, commercial, or other private purposes are terminable at notice.

With a view to the economic utilization of the available supply, the larger sources for the generation of electric energy are mostly retained by the government, while the distribution is entrusted either to joint companies, in which the government works jointly with private capital, or to private companies or local authorities.

In 1939 the installed capacity was approximately 200,800 kW, over half of which utilized water power. Only in Sumatra, where there are good local supplies of coal, did thermal power stations account for a large part of the total electricity production.

Electric Power Stations

(Installed capacity kW)

	Water	Steam	Diesel	Total
Java and Madoera	105,359	22,298	18,968	146,625
Sumatra	2,165	37,573	5,206	44,944
Borneo	—	300	3,091	3,391
Celebes	30	2,500	1,706	4,236
Other islands	20	—	1,588	1,608
Total	107,574	62,671	30,559	200,804

Based on official sources.

In Java and Sumatra there were twenty-four generating stations and in addition numerous small installations in factories and on estates throughout the archipelago. Of the twenty-four power stations nine had a capacity of more than 10,000 kW; details of these are given in the following table:

Electric Power Stations with a capacity greater than 10,000 kW.

Stations	Total capacity	Method of generation
<i>Java</i>		
Lamadjan (near Bandoeng)	19,200	water
Oebroeg (near Soekaboemi)	11,200	water
Kratjak (near Buitenzorg)	11,000	water
Mendalan (Kali Konto)	16,500	water
Simau (near Ponorogo)	10,800	water
Semampir (Soerabaja)	13,000	steam
Soerabaja	12,300	steam
Keting (near Loemadjang)	10,500	water
<i>Sumatra</i>		
Mantoeng (for Bangka tin mines)	12,000	steam

Based on official sources.

The general practice is generation of a three-phase alternating current of 50 cycles per second at 6,000 volts. This is stepped up to 70,000 volts for transmission to the electrified portions of the Java railways and to the large consuming centres, where it is stepped down to 6,000 volts for primary distribution and to 220/127 and 190/110 volts for secondary distribution by the four-wire system.

The power station at Oebroeg supplies the towns of Batavia, Buitenzorg and Soekaboemi, and the electric railway from Batavia to Buitenzorg. The power station at Kratjak links up with this system at Buitenzorg. Other stations at Bengkok, Plengan and Lamadjan generate power for the towns of the Bandoeng basin. The stations in Oost-Java and those in Sumatra each supply one area, with, in general, little interconnection.

Current consumption in 1939 was 332.4 million kW and 60% of this was used by the following eight towns:

<i>Town</i>	<i>Current (million kWh)</i>
Batavia	57.8
Soerabaja	53.3
Bandoeng	45.9
Semarang	17.9
Malang	13.1
Medan	8.0
Palembang	5.5
Padang	4.2

The consumption of current was increasing rapidly in the years before the Japanese occupation in 1941. In 1935 it was 237 million

kWh or nearly 100 million less than in 1939. The current consumed in 1935 was divided as follows:

Utilization of Current in 1935

(million kWh)

Lighting	135
Mining	54
Industry	12
Traction	10
Loss in transmission	26
	<hr/>
Total	237
	<hr/>

The total number of consumers in this year was only 206,300, of whom 165,500 were in Java and Madoera.

BIBLIOGRAPHICAL NOTE

There is a great scarcity of published information about the industries of the Netherlands Indies, and particularly about their location.

A certain amount of information is available in the Department of Overseas Trade Report, *Economic Conditions in the Netherlands Indies* (London, 1938), and in the *Indisch Verslag*, vol. II (Batavia); the latter is an annual publication.

A directory of firms in the Netherlands Indies, *Handboek voor Cultuur-en Handelsondernemingen in Nederlandsch-Indië* is published annually at Amsterdam.

Chapter X

LABOUR

Introduction: Labour in Java: Labour in the Outer Provinces:
Trade Unionism: Bibliographical Note

INTRODUCTION

Throughout the Netherlands Indies labour problems are mainly connected with the employment of Eastern labour by Western capital, but in other respects there is a striking contrast between the problems of Java and those of the Outer Provinces. In Java there is a surplus of labour, employment is mostly seasonal, and chiefly in factories or plantations. In the Outer Provinces there is a shortage of labour, employment is continuous, and there are few factories, but much of the labour is employed in mines. In Java there is a larger proportion of European labour, with a corresponding development of trade unionism. The most important single factor in this divergence was the Culture System, which opened up Java as a plantation area, created a vast supply of free labour, trained natives and Europeans to co-operate in production, and attracted men of enterprise from the Netherlands.

Under the Dutch East India Company, labour in private employment, mostly domestic or agricultural, was performed by slaves; labour for the government was compulsory and unpaid. Although true slavery existed, the normal form was debtor-bondage; most of the slaves were people who had made themselves over to their creditors for debts that they could not discharge, and they could at any time recover their freedom on payment of their liabilities. In 1818 the slave trade and importation of slaves was forbidden. The new Constitution of 1854 forbade the public sale of slaves, provided for the abolition of slavery from 1860, and prohibited debtor-bondage in Java. In 1872 steps were taken towards the gradual abolition of debtor-bondage in the Outer Provinces.

Regulation of Labour

The prevalence of slavery prevented the growth of customs governing the relations between masters and free servants, and, with

its decline, protection was given to the masters by imposing a penal sanction for the breach of service agreements. Such a penal sanction, found originally in the local regulations of 1829 for Soerabaja, was gradually extended over all the areas of European settlement. In 1872 the various local regulations were superseded by a general Police Regulation, which incorporated the penal sanction clauses. Owing, however, to Liberal protests in the States-General, these clauses were repealed in 1879. By this time employers in Java no longer needed special legislation to protect their interests, as there was an abundant supply of labour already accustomed to serve Europeans for wages, and from about 1880 the centre of interest in labour problems shifted to the Outer Provinces.

An elaborate organization has grown up for supervising the conditions of employment and the enforcement of regulations. It deals both with indentured labour and with free labour. An Inspector of Labour was first appointed in 1904 for the Oostkust Residency of Sumatra, the region of the plantations. In the following year a Factories Ordinance was passed to bring under control the rapidly increasing number of factories in Java. In 1908 the Inspector of Labour was charged with the supervision of recruiting and of the general working of the Coolie Ordinances. The inspectorate grew with the expansion of its activities, and in 1921 it was reorganized as a special service in the department of justice. The head of the service presided over the Labour Office, which comprised four sections: Legislation and Statistics; Security, including factory inspection; Trade Unions; and Labour Inspection in the Outer Provinces. Linked up with this are the Permanent Commission of 1925 and the Immigration Chamber of 1930, both mentioned above. Up to 1930 labour inspection in Java was dealt with in the section for Legislation and Statistics, but in that year a new section with four inspectors was constituted in Java.

One important duty of the Labour Department has been to fix and enforce minimum rates of wages. So far back as 1829 there were suggestions for the protection of wages, but under the Culture System the government was interested in keeping wages down, and until almost the end of the century low wages were regarded as a prime factor in the wealth of Java. The first effective measure for the protection of wages was the ordinance of 1898 dealing with the sugar factories. Subsequently rates of wages were fixed for indentured coolies. In the *cultuurgebied* of Sumatra the minimum rate was put at 42 cents per day for men and 37 for women. The normal rates have

ordinarily been higher, and in 1930 plantations in Sumatra were paying 57·5 cents to men and 44 cents to women; as the coolies also received cheap food, housing and medical attention, the real wages were much higher, and were estimated at 67·5 cents for men and 54 for women. The world economic depression reacted on wages, which in 1934 fell to 48 cents per day for men and 30 for women, but they rose again as the depression lifted. In Java, living is cheaper and wages run lower; before the depression the sugar factories paid 46 cents to men and 37 to women.

The inspectors also attend to all matters concerning the welfare of the employees. The regulations, both for indentured and free labour, insist on satisfactory conditions. Many estates pay great attention to hygiene, and provide good hospitals for the coolies and schools for their children; but on others the employees are less fortunate. This is especially the case under Chinese employers, whose ideas on hygiene differ from those of Europeans, and who look on regulations for the welfare of the coolies as restrictions to be circumvented rather than obeyed. On some estates employees are apt to be defrauded of their wages by dishonest practices in the estate shop, maintained nominally for the benefit of the coolies, and the management of these shops requires special attention. Infractions of the regulations are numerous also in connection with the employment of children, and of women on night work. The *panglongs* or timber mills in the Oostkust, Djambi and Riouw Residencies also require close supervision. These are owned by Chinese; in the large concerns Chinese only are employed, although in the smaller there is a majority of Malay coolies.

LABOUR IN JAVA

Cultivation was the most arduous of the services required by the government in the first half of the nineteenth century, and the demand for it was carried to extreme lengths under the Culture System, when the village headman was expected to furnish both land and labour for government plantations. Peace and order were rigorously enforced, the people enjoyed sufficiency and security, and there was a rapid growth of population, consequently there was a large supply of labour seeking employment. Some agricultural work for the government was unpaid, being regarded as an alternative to taxation, but much of it, although compulsory, was paid. In the factories and plantations managed by Europeans on behalf of the government, the payment of wages was general, and the natives thus

became accustomed to wage service for Europeans, while the Europeans gained experience in the handling of Oriental labour. With the Liberal reaction against the Culture System, planters took over the estates and factories from the government; but they still obtained land and labour through the village headman, who exerted his authority on their behalf as he had done previously for the State. The Agrarian Law of 1870, which marked the effective introduction of Liberal policy, was meant to encourage private enterprise while protecting native interests. It related primarily to land, but the peasants who leased their land for the cultivation of sugar-cane were also the labourers in the plantations and the factories. The law proved inadequate for the protection of native interests, and was amended in 1895 and 1898 by new regulations intended, among other things, to remove abuses consequent on the granting of advances by planters to their employees.

Special problems in connection with agricultural labour are found on land obtained on lease from native rulers, or held in private ownership. Under both forms of possession the relation between the landholder and the cultivator is nominally one of landlord and tenant, but in practice it is one of employer and employee. On the private estates the owner, as the representative of the government, has the right to demand compulsory labour from the occupants. In 1931 a proposal for the abolition of this right was rejected on the ground that f 11 million would have to be paid in compensation, and that the acquisition of such private estates by the government was preferable.

Apart from cultivation the requirements for compulsory labour fell under three heads: free services to officials (*pantjendiensten*); free labour on public works (*herendiensten*); and free labour for village amenities (*desadiensten*). With the economic development of Java these compulsory services became an obstacle to progress. Not only was unpaid compulsory labour inefficient in comparison with wage labour, but villagers working under compulsion could not be employed far from their homes, whereas the various public works required temporary concentrations of large supplies of mobile labour; moreover, work for the government reduced the supply of free labour available for private employers and tended to raise wages. Economic conditions required therefore the substitution of free labour for compulsory labour.

Paid labour was employed by the government for the first time in 1849 on the harbour and defences of Soerabaja. From that time onward the payment of labour became general so far as funds

allowed, though little money was available because of the employment of compulsory labour in lieu of taxation. In 1882, however, a capitation tax was introduced; the proceeds were applied in the first instance to the commutation of *pantjendiensten*, but a surplus remained available for public works that could not conveniently be carried out by *herendiensten*. From 1890 the government allowed the villages to buy off their *herendiensten* liabilities for a period of five years, and from 1902 remitted, without further payment, all *herendiensten* in Java, apart from the native states, where they have subsequently been reduced, commuted or abolished. Thus within the area under direct rule in Java the end of the nineteenth century saw the abolition of all compulsory services except *desendiensten*. Both in private and in public employ free labour was general. Measures taken subsequently for the protection of labour are described below.

LABOUR IN THE OUTER PROVINCES

The repeal in 1879 of the penal sanction clauses of the Police Regulation created a difficult position in those parts of the Outer Provinces where economic development had made most progress. Apart from mining districts, in which the chief employer was the government, the main centre of economic progress was the Oostkust Residency of Sumatra. Here the tobacco plantations, which had grown up rapidly since 1863, employed thousands of Chinese coolies, who were imported at considerable expense, were often of bad character, and were of little use to their employers for some time after their arrival; if they broke their contract, the employer had no effective remedy at civil law. It was chiefly to meet these difficulties that a Coolie Ordinance for the Oostkust Residency of Sumatra was published in 1880. During the next few years similar ordinances were successively applied in other parts of the Outer Provinces. Their general effect was that indentured labour should be recruited only under a contract registered before a government official, and labour so recruited was liable to summary penalty for wilful breach of contract or for idleness. The primary object of these ordinances was to give employers adequate control over their coolies; but the effect was to place the coolies at the mercy of their employers, and this led to serious abuses. About 1900, with the transition in Dutch colonial theory from the 'Liberal' to the 'Ethical' standpoint, exposures in parliament and in the press of the conditions obtaining on the plantations gave a new turn to labour policy; previously it had been directed mainly to

securing for employers an adequate supply of docile labour, but now it turned towards ensuring protection for the labourers.

The chief measures for dealing with the labour problem fall under three heads: the supervision of recruitment; the abolition of the penal sanction; and the more precise regulation of the duties of employers and employees, together with machinery for enforcing the regulations.

Recruiting of Labour

When labour conditions in the Outer Provinces first began to attract attention, the coolies, not only in the mines but also in the plantations, were predominantly Chinese; in early days in east Sumatra, out of some 4,000 imported coolies all but 150 were Chinese. The coolies were supplied at so much a head by professional recruiters, who cared nothing about the character of the men supplied or about their subsequent welfare. By about 1900 this system was being extended to Java, where coolie agents advertised their ability to export shiploads of 'prime quality labourers, carefully selected, sturdy, young, physically sound and strong'. The agitation for better conditions led to the practice of recruiting the Chinese coolies through official agencies in Singapore or Swatow, and in 1909 the government introduced regulations for the control of recruiting in Java. Under the latter regulations, professional recruiting agents in Java were required to obtain a licence and to deposit security; no emigration was allowed except under contract; all contracts had to be signed before an official; medical inspection was obligatory before embarkation; and the shipment of coolies was restricted to Batavia, Semarang or Soerabaja. These successive measures for the better supervision of recruiting encouraged the planters to take the matter into their own hands instead of engaging coolies through professional recruiters. The movement started in 1915 with the Deli Planters Association (D.P.V.) which subsequently combined with the General Association of Rubber Planters of East Sumatra (A.V.R.O.S.) to establish the General Deli Emigration Office in Java to recruit coolies for the East Coast. The South Sumatra Agricultural and Industrial Association followed this example in the recruitment of coolies for south Sumatra. Gradually, however, the planters have turned rather to encouraging the re-engagement of old hands (*laokeh*), and to seeking recruits by the voluntary emigration of fellow villagers whom the *laokeh* brings with him when returning for a further period of service. Some plantations have tried to create a local supply of free labour by allotting house sites and land to married coolies with the

object of forming labour colonies, but this policy is criticized as tending to make the men work less regularly because they are less dependent on their wages. Professional recruiting was prohibited in 1930, and in the same year an Immigration Chamber was established at Medan to prevent the enticement of coolies by rival employers.

Reform of Labour Conditions

The prevalence of abuses on the plantations was ascribed in the first instance to laxity in legal administration, and for the better enforcement of the law a Court of Justice was established at Medan, the headquarters of the *cultuurgebied*. But so long as the contracts contained a penal sanction the enforcement of the law helped the employer rather than the coolie. Reformers turned therefore, especially after 1909, towards securing the abolition of the penal sanction. Even where the contract contained no penal stipulations the coolies were liable to ill usage, and for the protection of such coolies the government in 1911 published the so-called 'Free' Labour Ordinance of 1911. This guaranteed them regular wages, suitable accommodation, adequate sustenance and a free passage home, and thus ensured them as good terms as labourers engaged under the Coolie Ordinances. 'Free' labour is often contrasted with 'contract' labour; but in fact 'free' labour is ordinarily engaged on a written contract, and the real distinction is that free or voluntary labourers are not liable under the penal law for a breach of the agreement. Proposals for the abolition of the penal sanction, however, were strenuously resisted, as the government thought it essential to efficient management even on its own tin mines and other enterprises. The matter came to a head in 1924, when a measure was laid before the States-General with a view to replacing the Coolie Ordinances by a legislative enactment. The preamble to this bill justified penal sanctions on the ground that local circumstances rendered civil process ineffective, but an amendment was accepted to the effect that the situation should be reviewed every five years with the object of eliminating the penal clauses. For this purpose a Permanent Commission for the Study of Labour Problems was constituted at Medan in 1925, with the special function of advising the government when the problem should be due for reconsideration.

Accordingly in 1930, the government laid a new Ordinance before the Volksraad. By this time plantation labour had assumed a new character. It was no longer mostly alien, temporary, and recruited by irresponsible professional recruiting agents, but much of the labour

was Javanese and exempt from penal liabilities, and the relations between the employer and employee have become more permanent and human. The new measure aimed at encouraging these tendencies. As finally passed it required concerns of ten years' standing to employ at least 25% of free labour from January 1932, rising to 60% from 1936; firms of less than ten years' standing were allowed a longer period of grace. Employers were permitted to make their own choice as between foreign labour and native, male and female, old and young; and those with more than one concern could treat their whole business as a single unit. Failure to comply with these conditions would entail forfeitures of the right to make further contracts with a penal sanction, and for contumacy existing contracts might be annulled. This ordinance was generally applicable in all the Outer Provinces in place of the local ordinances previously in force, and it consolidated and improved the regulations on food, holidays, accommodation and medical attention. It also required that employers should provide married coolies after five years' service with a house and garden.

Almost at the same time the Blaine Amendment to the United States tariff law of 1930 prohibited the importation of the products of labour employed under contracts with a penal sanction, unless they were products which could not be produced in the requisite quantities in the United States. This threatened the Deli planters with the loss of a valuable market for cigar wrappers, and they announced their intention of abandoning their right to apply the penal provisions of the new ordinance, and of recruiting all their labour on a voluntary basis. This was not very convincing as a moral gesture, for, owing to the depression, there was a surplus of labour on the estates; but it satisfied the conscience of the reformers and the customs regulations of the United States. Penal provisions were also renounced in respect of the coolies, mostly Chinese, in the tin mines of Bangka and Billiton. In 1932 the Ordinance of 1930 was amended by a clause providing that the passages relating to a penal sanction should not apply to employers who expressly forewent their rights to impose such sanctions. It appeared, however, that despite the penal sanction, some coolies preferred to work under the Coolie Ordinance as giving them greater security and, in particular, exemption from local taxes in native states to which free coolies were liable. The Free Labourer Ordinance of 1911 was therefore amended in 1932 to give free coolies similar protection.

Thanks to the Blaine Amendment and the world depression, the

results attained under the Ordinance of 1930 were greater than had been contemplated, and a further advance in the direction of free labour was possible when the Ordinance of 1931 came up for revision. The Coolie Ordinance of 1936 prescribed an increase in the percentage of free workers; abolished the penal sanction in all contracts of re-engagement; and reduced the maximum length of contracts with a penal sanction from three years to two. As before, the Governor-General might allow special exemption in particular cases on sufficient grounds.

At the latest revision in 1941 the penal sanction was abolished. It had in fact practically disappeared. At the lowest point of the depression it seemed that Chinese labour also would disappear, and there were indications that male Javanese coolies were being replaced by female, on lower wages. In 1939 there was a remarkable increase in the number of Chinese coolies and an equally remarkable decline in the number of female Javanese coolies. Details are given below; the figures show the number of coolies at the end of each year.

Plantation Coolies in the Outer Provinces

Year	Chinese	Javanese		Others	Total
		Male	Female		
A.—Contract Labour					
1930	51,799	221,650	77,762	1,289	352,610
1934*	1,317	9,727	5,231	3	16,278
1937*	13,034	12,418	4,964	2	30,414
1938*	7,752	7,791	3,219	—	18,762
1939	3,634	1,654	1,143	—	6,531
B.—Free Labour					
1930	11,645	68,699	31,647	14,314	126,305
1934*	20,487	142,394	46,611	5,881	215,373
1937*	19,305	185,894	96,627	7,414	309,240
1938*	18,315	185,495	98,074	11,793	313,677
1939	194,349	103,763	18,880	10,413	327,405
Totals					
1930	63,444	290,459	109,409	15,603	478,915
1934*	21,804	152,121	51,842	5,884	231,651
1937*	32,339	198,312	101,591	7,416	339,656
1938*	26,067	193,286	101,293	11,793	332,439
1939	198,083	105,417	20,023	10,413	333,396

* Excludes Manado, Celebes, Moluccas, Bali and Lombok and Timor Residencies in 1934, and South and East Borneo also in 1937 and 1938, as the returns are incomplete. The number excluded was less than ten thousand.

Source: *Statistical Abstract of the Netherlands Indies*, 1940. Table 96 (Batavia, n.d.).

Compulsory Labour

In the Outer Provinces, as in Java, there is a tradition, inherited from native rule, of compulsory labour for the government. During the early years of the present century, when effective administration was being rapidly extended throughout the archipelago, compulsory labour was demanded on a scale that led not infrequently to resentment and unrest. Since then the policy has been to restrict the demand for compulsory services, and by allowing commutation in cash, to pave the way for replacing them with taxes. It has not been possible to abolish them, because almost everywhere the population is sparse and unaccustomed to wage labour, and in the native states, which form 60% of the area of the Outer Provinces, the abolition of compulsory services would encroach on the privileges of the rulers. Measures have been taken, however, to define more closely the work for which compulsory labour may be required, and the people who are liable to render compulsory services. A schedule, periodically revised, shows for each district the number of days a year on which the inhabitants are liable to render service, and rules have been framed for the commutation of such services. An annual return provides information under these various heads.

Compulsory labour is now limited ordinarily to the construction and maintenance of roads, including waterways, bridges and culverts. No compulsory labour is required in the directly governed part of Riouw, in West-Borneo, in the sub-district of Banda, and in Ternate and New Guinea. In Bangka and Billiton the place of compulsory labour has been taken by a poll tax, and in the Minahasa region of Celebes by a traffic tax. In the municipality of Medan in eastern Sumatra compulsory labour has been abolished since 1928. Elsewhere in the area under direct rule, the number of days for which people were liable to labour ranged, in the schedule for 1937, from fifteen to thirty, though in fact only thirteen to twenty-eight were required. The number of people liable for service was 1.42 million, of whom nearly one-quarter bought themselves off for *f* 1.76 millions. In the native states the number of days for which people were liable for service ranged from twelve to thirty-two, and the number actually demanded was fifteen to twenty-three; the people liable for service totalled 1.37 million, of whom about a quarter bought themselves off for *f* 1.21 million. It deserves notice that during the depression the number of people who purchased exemption fell off sharply, a fact suggesting that taxation in service has much to commend it in backward areas.

TRADE UNIONS

One notable feature of labour problems in the Netherlands Indies is the growth of trade unionism among the natives. This is a direct consequence of the character of the European section of the population, which includes many who belonged in Europe to democratic political associations and trade unions, and have brought their politics and unionism to the East. The first trade union was that formed by the Rail and Tramway Companies in 1908. This included native members, and before long purely native trade unions came into existence. The formation of a Union of Customs Officials (1911) was followed by Unions of Education Officials (1912), Pawnshop Officials (1912), Opium Officials (1916), and Public Works and Treasury Officials (both in 1917). Under the influence of native political organizations the movement spread to employees in private business, and a Union of Wage-earners and Field-labourers was formed in 1915, and of Factory Workers in 1917. By the end of 1919 twenty-two native unions, with a membership of 77,000, were represented at a conference which led to the formation of a Central Union.

The combination of political and economic aims proved unfortunate. A split on political grounds caused the secession of fourteen unions to form a Revolutionary Central Union. Both European and native unions were prominent in the political and economic unrest which followed on the war of 1914-18, but as trade unionism became more involved in nationalist politics, its rate of progress was retarded. It still went forward, however, though more slowly, and in respect of membership the movement reached its highest point in 1931. By this time the world economic depression was undermining the position of labour. With the general reduction of establishments the number of workers eligible for membership declined, and those who could still find work were more intent on keeping their job than on pressing for better terms. The membership rapidly declined by more than one-half, but towards the end of the depression there were signs of recovery.

The unions of officials concern themselves largely with the scales of salaries. The unions of private employees press for unemployment and old age insurance, and for legislation regarding accidents. Some of the native unions have endeavoured to build up a permanent non-political organization on the ground that the political parties neglect their interests. Where possible, the government assists in the arbitration of disputes between the unions and employers. Strikes

Membership of Trade Unions

	1931		1937	
	a	b	a	b
Federation of Unions of Public Servants	15	11,878	16	5,684
Federation of Unions of Higher Officials	18	1,564	15	1,011
Federation of Roman Catholic Unions	4	917	5	939
Federation of Unions of Native Public Servants	—	—	4	1,044
Federation of European Employees	7	4,582	7	3,128
Federation of Native Unions	12	37,170	20	21,765
Federation of Indonesian Unions	4	5,251	—	—
Federation of Chinese Unions	—	—	5	356
Unaffiliated European Unions	16	6,921	20	10,825
Unaffiliated Native Unions	30	43,061	15	11,995
Total	106	111,344	106	56,747

(a) *Number of associations.* (b) *Membership.*

Source: *Indisch Verslag*, 1938, vol. II, p. 234 (Batavia, 1938).

are not infrequent, but the resort to this weapon depends largely on economic conditions. In 1936 there were only five strikes, but in 1937, when conditions were improving and the government was recommending employers to raise the pitch of wages, there were twenty-two strikes, mostly on the ground that wages were too low.

BIBLIOGRAPHICAL NOTE

An account of the history of labour in the Netherlands Indies is given by J. S. Furnivall in *Netherlands India* (Cambridge, 1939). J. H. Boeke, *The Structure of Netherlands Indian Economy* (New York, 1942) has an interesting discussion of labour problems and also describes recent developments.

A publication of the International Labour Office (*Studies and Reports, Series B, No. 29, 'Problems of Industry in the East'*. Geneva, 1938) gives information on labour problems and the nutrition of workers in the Netherlands Indies.

Chapter XI

COMMERCE

Introduction: Exports: Imports: Direction of Foreign Trade: Trade and the Economic Crisis, 1930-37: Regulation of Exports: Regulation of Imports: Regulation of Foreign Trade by Reciprocal Agreements: Bibliographical Note

INTRODUCTION

In its general character the commerce of the Netherlands Indies resembles that of other tropical regions; it is an exchange of raw material for manufactures. Thus it depends on the demand for a comparatively small number of products, and the market position of these products depends on many factors, mostly beyond the control of local merchants and producers. Yet in respect both of imports and exports there are distinctive features, due mainly to the large share of European enterprise in production. Commercial policy has passed through three main stages. From 1830 to 1870, under the Culture System (see p. 84), production for export was conducted by or on behalf of the government; the State was one large business enterprise.

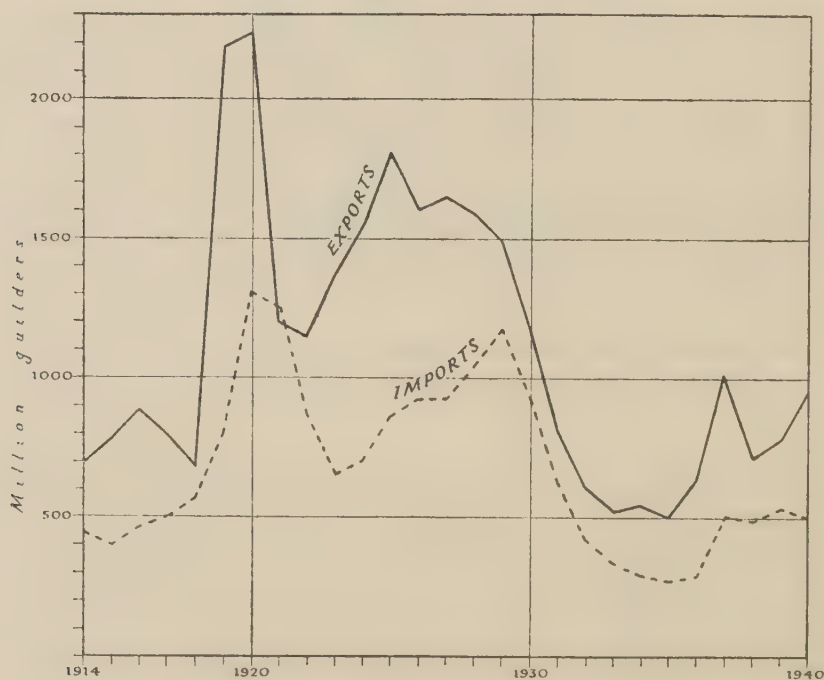


Fig. 59. Exports and imports, 1914-40

Source: *Statistical Abstract of the Netherlands Indies*, 1940, Table 103 (Batavia, n.d.)

From 1870 to 1930 State enterprise gave way to private enterprise with a minimum of interference by the government. Since 1930, official policy has still favoured private enterprise, but in practice State assistance, protection and regulation have been necessary.

The importance of the European factor has reacted in many ways on economic development. It has brought in large investments of capital with a specialized banking system to provide the necessary credit, and it has encouraged the adoption of scientific and mechanical production, and therefore the import of machinery and other goods necessary for production. Further, it has stimulated native production, and thus indirectly, as well as directly, has been chiefly responsible for the growth of trade. Native trade is confined almost exclusively to petty retailing, while wholesale trade remains largely in European hands, with the Chinese as middlemen between Europeans and natives. This is a feature in which the trade of the Netherlands Indies resembles that of tropical dependencies in general, though it is exceptional in the wide range of exports.

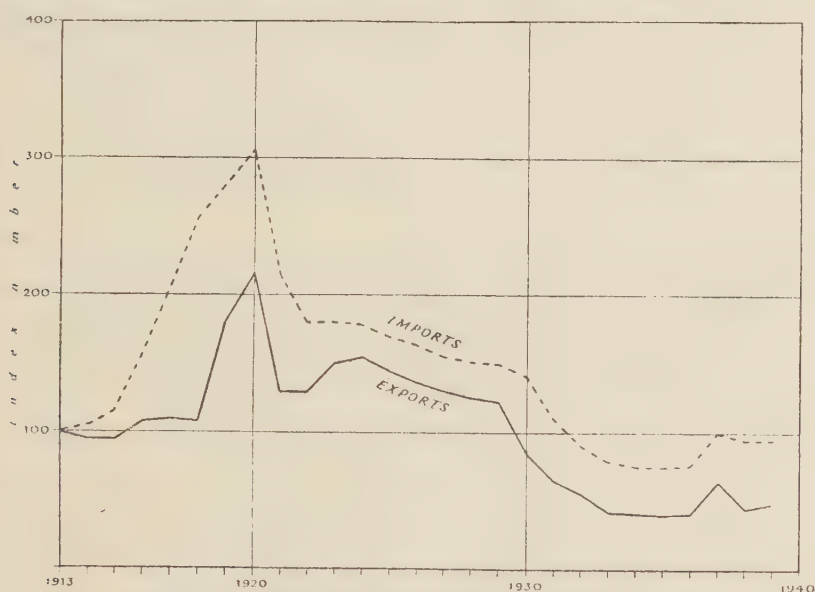


Fig. 60. Prices of exports and imports, 1913-40
(1913=100)

Source: *Statistical Abstract*, 1940, Table 104.

The value of the trade of the Netherlands Indies since 1913 is shown in the table on p. 298 and in Fig. 59. Prices have fluctuated so widely, however, that the uncorrected figures for value are apt to give a misleading impression as to actual progress in terms of the volume of goods. Thus, the value of exports in 1920 was three times as much as in 1913; but, as prices also rose, the figures for value exaggerate differences in the quantity of goods exported. The course of prices since 1913 is shown in Fig. 60.

Value of Trade (f million)

Year	Imports					Exports				
	Merchandise			Bullion and specie	Total	Merchandise			Bullion and specie	Total
	Private	Govt.	Total			Private	Govt.	Total		
1913	437	27	464	29	483	614	57	671	12	683
1925	818	21	839	23	862	1785	17	1802	11	1813
1929	1072	36	1108	57	1165	1446	36	1482	41	1523
1930	855	32	887	34	921	1160	32	1192	31	1223
1937	480	18	498	18	516	991	18	1009	13	1022

Source: *Statistical Abstract*, 1940, Table 103.

Wholesale and Retail Trade.

The foreign trade, both in exports and imports, is largely in European hands, but the Chinese have a considerable share. Among European merchants all the leading nations are represented, and of recent years the Japanese have been making rapid progress. The native share in foreign trade is insignificant. Wholesale trade within the Netherlands Indies rests mainly with the Dutch or Chinese. The latter, in addition to engaging in wholesale trade on their own account, function largely as middlemen between European and native.

Retail trade ranges from that of large departmental stores and specialized shops, little if at all inferior to those of Europe, down to village bazaars and wayside stalls. In the larger inland towns the public bazaars are under the control of the local authority, and many are conspicuous among such institutions in the East for their comparative cleanliness and for the attention paid to hygiene. Except in the largest establishments in the chief towns, few Europeans are engaged in retail trade, and in 1930 out of nearly two thousand 'European' retailers, 60% were Japanese. Many of these were managers of cheap miscellaneous stores, employing native assistants. These stores are notable partly because here natives are engaged in retail trade on modern western lines, and partly because, contrary to oriental tradition, fixed prices are charged.

EXPORTS

The growth of the export trade has been due not merely to a greater output of staple commodities, but, as suggested above, is largely due

Chief Exports, 1870-1939

a. value (f millions) b. Quantity (thousands of metric tons)

	Coffee		Copra		Rubber		Sugar		Tapioca products		Tea		Tobacco		Tin		Petroleum products	
	a.	b.	a.	b.	a.	b.	a.	b.	a.	b.	a.	b.	a.	b.	a.	b.	a.	b.
1870	44	—	—	—	—	—	32	—	—	—	2	—	4	—	7	—	—	—
1875	77	70	—	—	—	—	52	209	—	—	—	—	9	13	—	—	—	—
1900	35	51	10	67	—	—	74	736	—	—	4	8	32	54	24	22	5	—
1913	23	29	55	229	24	7	157	1471	9	—	22	27	92	87	37	28	113	616
1930	36	63	77	375	173	296	254	2838	14	136	70	82	59	80	58	42	190	4822
1937	26	100	63	506	298	483	51	1365	18	447	49	76	41	50	84	51	167	6290
1939	12	66	25	529	215	378	76	1376	10	279	57	74	*	*	59	39	155	6425

* Complete figures not available

Source: *Statistical Abstract*, 1940. Tables 110-115, 121, 123 and 124.

to the introduction of new products. Among the chief items during recent years are rubber, wholly new, and copra and cassava, practically new; tea and tobacco have gained largely in importance; coffee, formerly the most important commodity, is now comparatively insignificant in value, though more is exported than before; and exports of sugar, after rising steadily in value and volume, have fallen away since the onset of the world depression—it is remarkable that in 1937 the value of sugar exported was practically the same as in 1875 though the quantity was six times as great. But the outstanding feature of the present century has been the growth of exports of mineral products, and especially of petroleum. The following table summarises the course of trade in these commodities.

Certain other products have also come into prominence during recent years. The most conspicuous progress has been shown by palm oil, fibres, quinine salts and pepper, while exports of kapok and cinchona bark have remained fairly steady:

	Palm oil		Fibres		Quinine salts		Pepper	
	Quantity*	Value†	Quantity	Value	Quantity	Value	Quantity	Value
1931	61·4	12·1	70·3	12·5	54	1·43	31·8	19·8
1939	231·6	15·8	106	10·5	163	4·13	61·7	9·8

* Thousand metric tons

† f million

Source: *Statistical Abstract*, 1940, Tables 116, 117, 119, 120.

The table on p. 301 gives the exports grouped according to the official returns. The groups are arranged in order of value in 1937 and details are given under the general heads for important or specially interesting products. Sago, cinchona bark and quinine, pepper and kapok are all products of which the Netherlands Indies have very nearly a world monopoly.

Export of Native-grown Produce

Another new development of recent years is the increasing share of the natives in the export trade. Under native rule the people cultivated their land and grew products for home consumption, but the Dutch East India Company, working through the native rulers, required them to produce as tribute crops for the European market, especially coffee. Raffles thought to encourage natives to produce for export by the stimulus of high prices; but Van den Bosch under the Culture System reverted to compulsion, and the people were again

Exports from the Netherlands Indies by commodities, 1937
(value in f millions)

Rubber and gutta percha				298·1
Petroleum and petroleum products				166·6
Oil seeds				104·7
Palm oil and palm seeds	29·0	Copra	62·6	
Minerals and mineral products				91·4
Tin	29·4	Tin ore	54·7	
Sugar				51·1
Tea				49·1
Tobacco				41·1
Miscellaneous vegetable products				37·8
Maize	6·8	Rice	3·4	
Wood	5·4	Citronella oil	2·1	
Resins	3·8	Sago	1·8	
Drugs and spices				26·6
Cinchona bark and quinine	10·3	Areca nuts	5·7	
Pepper	7·0	Nutmegs	1·2	
Coffee				26·1
Fibres				23·4
Kapok	7·4			
Tapioca				18·4
Animal products				12·6
Miscellaneous products				5·0
Total				953·0

Source: *Indisch Verslag*, 1938, vol. II, p. 330 (Batavia, 1938).

required to work for the government. During the Liberal period, planters took the place of the government, and employed native labour in the production of export crops, but on their own land the natives still grew crops for home consumption.

During the present century, however, the position has changed. At first, it was not so much that natives began to cultivate for the European market as that the European market expanded to cover native produce. Europeans had long purchased tobacco grown by natives; now, they began to buy through Chinese middlemen, maize, groundnuts, chillies, copra and various other products that the people had formerly grown for the local market. At the outbreak of the war of 1914-18 about one-quarter of the agricultural exports of

the whole of the Netherlands Indies, and in the Outer Provinces two-fifths, consisted of native produce.

The increasing importance of rubber in the world economy gave a new stimulus to native production for export and, for the first time, the people began an extensive cultivation of produce intended primarily, or even solely, for export. A further development was the cultivation of tea for sale to the tea plantations, and of cane-sugar, formerly grown almost exclusively by European planters. Thus, of recent years native production has accounted for nearly half the agricultural exports of the country as a whole, and in the Outer Provinces for over one-half.

The natives, however, are not the actual exporters. For the most part they sell their produce to Chinese middlemen, and the export trade remains in European and, to a lesser extent, in Chinese hands. Thus, considering exports as a whole, the European share is still three-quarters to four-fifths.

Origin of Exports

There have been changes in the local distribution of goods produced for export. Under the Culture System, when most of the merchandise was consigned by the government, the trade centred in Java. From 1870 onwards private enterprise took the place of the government, but Java remained almost the only centre of production, except the Oostkust Residency of Sumatra, which exported large quantities of tobacco. After 1900, however, the newer commodities for export came mostly from the Outer Provinces.

In 1877, the first year for which useful figures are available, the total value of exports from the Outer Provinces was only *f* 23 million. The course of subsequent development is tabulated below. This

Origin of Exports, 1880-1937 (f million)

	1880	1900	1913	1925	1929	1935	1937
Private Trade							
Java	95	157	317	837	710	171	297
Outer Provinces	42	73	297	947	735	301	694
Total	138	230	614	1784	1446	472	991
Total, including Government Exports	175	258	671	1801	1446	472	991

Source: *Indisch Verslag*, 1938, vol. II, p. 333 (Batavia, 1938).

table shows that, even before the war of 1914-18, exports from the Outer Provinces were little behind those of Java in value. By 1925 the rubber boom gave them the lead, and for a few years priority depended on the relative value of rubber and sugar. With the onset of the world depression, there was a slump in sugar, and the trade of the Outer Provinces became far more valuable than that of Java.

IMPORTS

The growth of imports represents not merely a larger import of the old commodities but the introduction of new ones. Up to 1870 the imports consisted predominantly of cotton manufactures. With the development of private enterprise, dating from about that year, the import of cotton goods continued to expand, but the growing population, and especially the coolies on the plantations, required imported rice; fertilisers, machinery and iron and steel also began to figure prominently in the returns. During the prosperous years at the beginning of the present century there was rapid progress in the import of all kinds of goods. During the war of 1914-18 and afterwards, prices fluctuated so violently and rapidly that the value of imports no longer serves as a useful basis for comparison. The great variety of commodities under each head, some bulky, others costly, precluded comparison by volume. For any intelligible comparison it is necessary therefore to use index numbers, as in the following table.

Chief Imports, 1870-1937

a. Nominal values (*f* million) b. Index no. c. Corrected value

Year	Rice and Paddy			Yarns, Piece Goods and Rope			Fertilisers			Machinery and Tools			Iron and Steel		
	a.	b.	c.	a.	b.	c.	a.	b.	c.	a.	b.	c.	a.	b.	c.
1870	0.6	—	16	16	—	—	—	—	—	0.6	—	—	2	—	—
1900	17	—	—	36	—	—	5	—	—	11	—	—	10	—	—
1913	56	100	56	96	100	96	12	100	12	33	100	33	35	100	35
1925	75	171	47	208	208	100	18	165	11	51	160	32	43	160	27
1937	11	92	12	158	97	163	9	99	9	57	130	44	47	130	36

Source: J. S. Furnivall, *Netherlands India*, p. 339 (Cambridge, 1939).

The table on p. 304 gives the imports grouped according to the official returns. The groups are arranged in order of value in 1937.

and details are given under the general headings for important products.

Imports into the Netherlands Indies by commodities, 1937
(value in f millions)

Yarns, piece goods, rope, etc.				157.6
Cotton yarns	14.9	Other piece goods	33.8	
Other yarns	4.0			
Cotton piece goods	91.6			
Foodstuffs and luxuries				78.1
Rice	11.2	Beverages	6.8	
Other foodstuffs	50.7	Tobacco	9.4	
Metals and metal articles not included in other groups				63.7
Iron and iron alloys	47.4	Copper and copper alloys	5.7	
Tin plate	7.0	Aluminium and aluminium alloys	1.2	
Machines, tools, instruments, etc.				57.3
Chemicals, medicines, etc.				44.6
Chemicals	25.7	Fertilizers	9.1	
Medicines	7.1	Paints, matches, cosmetics, etc.	14.2	
Motor vehicles and railway rolling stock				27.2
Paper and printed matter				18.4
Minerals and mineral products				10.5
Petroleum products	6.4	Cement	1.5	
Miscellaneous imports				29.6
Glass and glassware	5.8	Hides and leather	4.0	
Animal and vegetable products	5.4	Earthenware and porcelain	2.9	
Wood, furniture, etc.	5.4	Building materials	1.1	
Tyres	4.8	Livestock and plants	0.2	
Total				467.0

Source: *Indisch Verslag*, 1938, vol. II, p. 326-9 (Batavia, 1938).

DIRECTION OF FOREIGN TRADE

The direction of trade shows remarkable changes. When the Dutch recovered their possessions after the Napoleonic wars they were quite unable to compete with English merchants; they were lacking in ships, manufactures, capital and, chiefly, in enterprise. Van den Bosch restored the situation. He built up an export trade in Java, manufactures in the Netherlands, and a mercantile marine for which Javanese exports and Dutch manufactures provided cargoes. By 1870 the imports had increased three-fold, and the Netherlands furnished two-fifths; the exports had increased nearly seven-fold, and the Netherlands took three-quarters.

The fortunes built up on the Culture System (see p. 84) created a new generation of capitalists who introduced the Liberal System. One of their main tenets was freedom of economic enterprise, and Free Trade and the Open Door became a tradition of Dutch colonial policy. Although the Dutch share of the trade declined under this system, the import of Dutch manufactures rose greatly and confirmed the belief in Liberal principles.

The world economic depression, the general tendency towards economic self-sufficiency which cut off the exports of the Netherlands Indies from their foreign markets, and especially, the Japanese invasion of the import trade, necessitated a reversal of the former policy. Thus the government was compelled to exercise a strict control over both production and trade.

Trade with the Netherlands

Approximately a quarter of the trade of the Netherlands Indies has been with the mother country, though during the economic depression the proportion of imports fell while exports rose. Copra, sugar, tin and tin ore, palm oil and rubber make up the greatest bulk of the numerous commodities exported, though the export of sugar has varied greatly, ranging from 401 tons in 1935 to 119,591 tons in 1937. Cotton piece-goods are the chief of the numerous imports from the Netherlands. Fertilisers, principally for the use of the sugar growers, form another important item.

Trade with Singapore and Hong Kong

The large trade with these two ports is chiefly owing to their importance as distributing centres for the Far East and the Pacific. Some of the raw materials from the Netherlands Indies are still processed and prepared for export in Malaya, though in this respect the Netherlands Indies is becoming increasingly independent.

Trade with the United States

Both the export and import trade with the United States increased after the opening of the Panama Canal in 1914, as bulky cargoes could then be transported by sea direct to ports in the eastern and southern States. Rubber and palm oil are among the chief exports, while imports include motor cars, machinery, fertilisers and certain food-stuffs.

Trade with Great Britain

Great Britain receives a considerable portion of the rubber exported from the Netherlands Indies as well as smaller amounts of many foodstuffs and beverages, among which may be mentioned tapioca and tea. In 1928 over 50% of the textiles imported by the Netherlands Indies came from Great Britain, but by 1939 the proportion had fallen to under 10% of the total. Tobacco and chemicals are imported in some quantity from Great Britain.

Trade with Japan

Exports to Japan have remained at a fairly low level and showed little change between 1929 and 1938. Bauxite, maize, tin and petroleum are among the chief exports. At one time Japan was a most important buyer of Java sugar. In the period 1918-28 the shipments averaged 340,000 tons a year, but they fell rapidly during the depression and have never recovered their former importance. In 1938, the exports of sugar to Japan were less than 2,000 tons.

Imports from Japan rose from about 10% of the total in 1929 to 30% in 1935 and thereafter declined to about 15% in 1938 as a result of the regulation of trade by the Netherlands Indies government. Textiles and yarns are the chief items imported.

TRADE AND THE ECONOMIC CRISIS, 1930-37

The apparent prosperity after the war of 1914-18 rested on unsure foundations. Production outpaced consumption, and plantations of rubber, tea and other crops that take some years to reach maturity, were now beginning to yield, and flooded an already saturated market. Experiments in control proved unsuccessful, and foreign countries encouraged the local production of the crops on which the prosperity of the Netherlands Indies depended. Prices fell, and with the fall in the value of produce, the burden of interest on loans raised by the government weighed more heavily. Then in 1929 the unfavourable conditions were aggravated by a widespread failure of rice and other crops essential to the welfare of the natives.

The Netherlands Indies was, therefore, ill able to meet the catastrophic fall in value of agricultural produce that followed on the crisis in Wall Street in September 1929. At first, there was an attempt to find a remedy in greater economy of production with a larger out-turn at a lower cost, and in 1930 the volume of exports rose although their total value fell. Lower prices of the commodities exported were met by higher tariffs in importing countries and it



Plate 58. Pottery market at Denpasar, Bali



Plate 59. Offices of the *Nederlandsche Handels Maatschappij* (N.H.M.), Batavia
This company is one of the largest in the Netherlands Indies. It is a compound business functioning as a single enterprise, with a joint commercial and financial management.

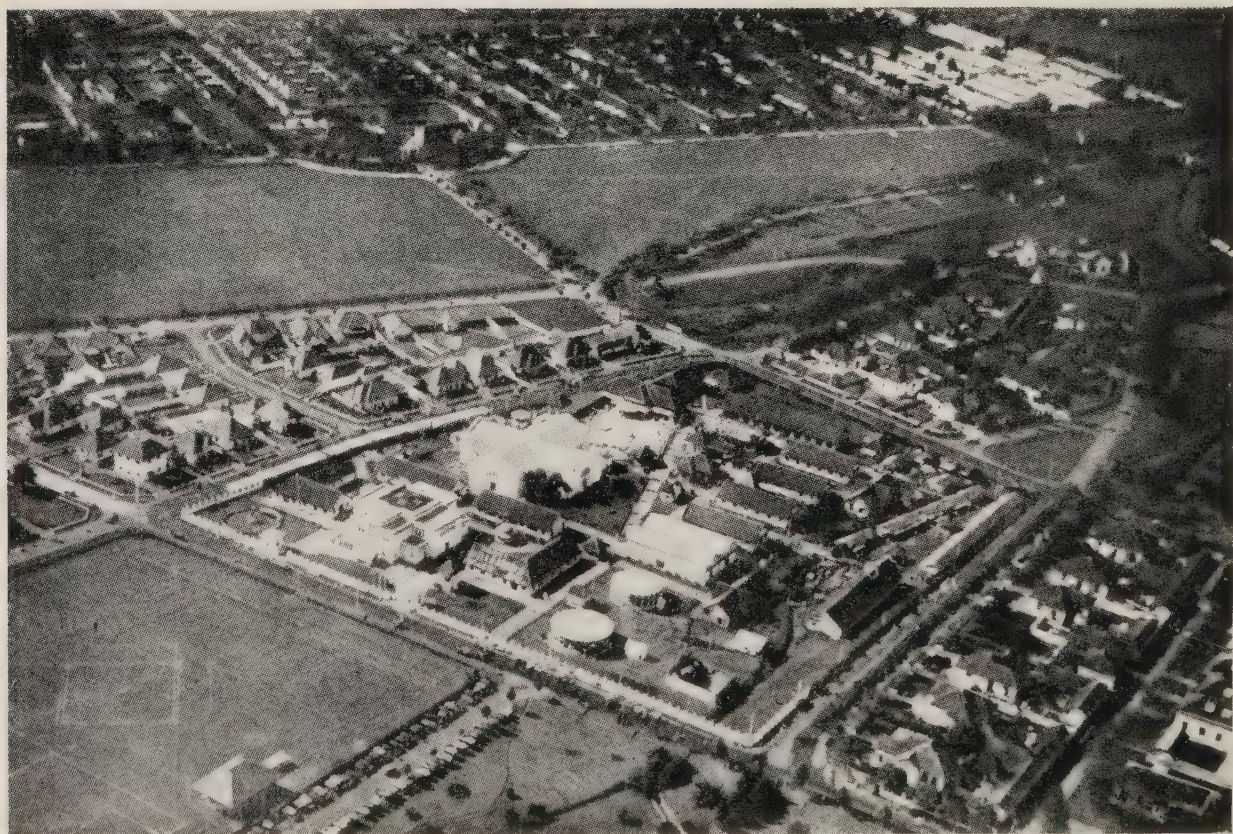


Plate 60. Grounds and buildings of the Netherlands Indies Annual Fair at Bandoeng
The first Annual Fair was held in 1920. The principal object of the fair is to promote commerce and industry.

became clear that economic measures alone were ineffective against political devices. With the departure of Britain from the gold standard and the devaluation of the yen the economic and financial systems of the Netherlands Indies threatened to collapse. The Netherlands' refusal to devalue the guilder until 1936 further aggravated the situation in the East. The feeling was general that the producer, already hit by the low level of prices to which primary products had fallen, suffered again by being forced to accept such a low equivalent in guilders for all sales to sterling and dollar countries. Gradually and with reluctance, the government and people had to accept the need for an increasingly stringent control over production and trade. With earlier devaluation, it might have been found that some of the measures of regulation of trade by the government were not necessary.

The measures adopted may be classed under several distinct, though inter-related heads:

(a) Measures for the regulation of output, either directly by the restriction of output, or indirectly by the control of exports. For some products—tin, sugar and rubber—it was necessary for the Netherlands Indies to act in co-operation with other producing countries. The Netherlands Indies had a practical monopoly of other products, such as quinine and kapok. For some goods, largely of native origin, the chief need was to improve and standardize production, and to organize better arrangements for marketing.

(b) Measures for the regulation of imports in order to protect the markets for local produce, especially the market for native food crops, and the market for new industries called into existence by the inability to import foreign goods.

(c) Measures taken to recover foreign markets by quotas and commercial treaties on the principle of reciprocity.

(d) It was also found necessary to protect local shippers, exporters and importers by regulations controlling the carriage of goods to and from the Netherlands Indies.

(e) This complicated system of control over foreign trade reacted on internal trade relations and therefore led to the regulation of these also.

These various measures are described below, but the foregoing brief summary will indicate how widely the Netherlands Indies has been forced during the past decade to depart from its tradition of economic freedom, and to what an extent it has had to bring under control the whole apparatus of commerce and production.

REGULATION OF EXPORTS

International Regulation of Output

Tin. During the period 1922–27 the world consumption of tin was rising; but production was increasing still more rapidly, and by 1928 was ahead of the demand, then estimated at 170,000 tons. Moreover, in the United States alone the reclamation of tin had risen from 19,510 tons in 1922 to 33,000 tons in 1928. The excess of tin caused a fall of price from £315 a ton in March 1927 to £239 in March 1928. Consumption rose to 180,000 tons, but production rose still further to 190,000 tons, and the 'Tin Producers' Association put forward a scheme of voluntary restriction. With the general economic collapse the consumption in 1930 fell to 140,000 tons and the price to £104, while surplus stock rose to 50,000 tons.

This was a serious matter for the government of the Netherlands Indies, which derives much revenue from tin. As almost the whole output was under government control, there were no private interests to conciliate, and the government was free to join in international schemes for restricting production. An attempt on voluntary lines was unsuccessful. In February 1931, the British government, representing producers in Malaya and Nigeria, and the Dutch and Bolivian governments agreed on the adoption of a plan 'to secure a fair and reasonable equilibrium between production and consumption with the view of preventing rapid and severe oscillations of price.' Siam, where production was largely British, joined in May, and an International Tin Committee was formed, on which each government was represented. This allotted to each participant a standard tonnage, and restriction was to be enforced by a percentage quota based on an agreed figure of production in 1929. World production in this year was estimated to be 186,518 tons, of which the Netherlands Indies contributed 31,100 tons.

The original objective was to reduce world production to 140,000 tons, i.e. to 75%; but the Netherlands Indies was allowed a quota of 83·71%. In May 1931, however, a further cut of 20,000 tons became necessary, and in August of this year an International Tin Pool was formed to buy and store 20,000 to 25,000 tons. Although prices rose, the stock still remained excessive and in January 1932, production was further cut down to 56%. This was not sufficiently drastic, and in June the International Tin Committee suggested a reduction to 44%, but the Tin Producers' Association obtained the acceptance of a reduction to 33·3%. This at length had the desired effect of reducing visible stocks, which fell below 50,000 tons for the

first time since 1930; by 1934 the International Tin Pool had been sold at a profit.

Countries outside the International Tin Committee were increasing their output, and in the period 1933-34 their share rose to 25% of world production. It was necessary, therefore, either to abandon restriction or to bribe these other countries to come in. The latter course was adopted and in 1934 a new agreement was made to which Indo-China, the Belgian Congo, Portugal and Great Britain were admitted on favourable terms. The objects were much the same as before; but clauses were included to provide for the maintenance of reasonable stocks and for the representation of consumers' interests; any participant could withdraw on six months' notice if production by non-participants should increase beyond a stipulated amount. Under this agreement a buffer stock of some 8,000 tons was purchased with a view to guard against rapid changes of price due to speculation. This reserve was sold by September 1935, and not renewed. By this time the depression was lifting, and in 1936 the extension of the agreement was strongly opposed. At length, however, on the day of its expiry, it was renewed until 1941. In 1937 the Netherlands Indies, under this agreement, produced more tin than ever before; 39,391 tons as against 35,141 tons in 1930. During 1938 and 1939, however, the production was only 27,737 tons and 28,200 tons respectively.

Meanwhile there had been great changes in the processing and distribution of tin. In 1931 two-thirds of the product went as ore to Singapore for extraction, and one-third as tin to the Netherlands. When a smelter was set up at Arnhem the ore was shipped to the Netherlands; subsequently, after the Dutch firm became linked up to the Consolidated Smelters, much of the ore was sent to the smelting plant of this company at Penang. The chief foreign customer is the United States, which is the largest consumer of tin, but produces none at home.

Sugar. The regulation of sugar presented more difficult problems, partly because the industrial crisis was aggravated by protective tariffs abroad, and partly because the production of sugar, unlike that of tin, was in the hands of numerous private concerns. But the sugar planters had been co-operating since 1918, when they formed the Association of Java Sugar Producers (V.J.S.P.) to dispose of the large stocks that had accumulated during the war. Practically all the factories belonged to this association, which had protected the interests of its members so successfully that in 1930 the Netherlands

Indies held aloof from the Chadbourne plan, devised in Cuba, to restrict production. The V.J.S.P. tried to meet the situation by holding up stocks. Early in 1931, however, China and India raised their tariff on imported sugar, and the government felt obliged to adopt the Chadbourne plan, which aimed at reducing the area under sugar by $17\frac{1}{2}\%$ annually and increasing consumption in the East by 100,000 tons. In May 1931 the Sugar Export Ordinance prohibited for five years the export of sugar without a licence; and was followed by the Sugar Export Decree, fixing the total quantity to be exported annually. Price control, however, still rested with the V.J.S.P. which adhered to its policy of holding sugar off the market, and many members who disapproved of this policy resigned.



Fig. 61. Stocks of sugar in Java, 1929-38

Source: *Statistical Abstract*, 1940, Table 63.

The government plan depended on the existence of a single selling agency, and the V.J.S.P. could no longer act in that capacity, owing to the numerous resignations. In December 1932 the government formed a new central selling organization, known from its initials as *N.I.V.A.S.*, of which membership was compulsory. All owners of sugar factories were required to join; no one might transfer sugar,

except to another member; no one could transport sugar without a licence; and no one might sell sugar except through *Nivas*. By a separate decree, quotas of sugar production were fixed for each estate. The management was vested in a board with an executive committee on which the government and the Java Bank were strongly represented, and the government retained a right of veto over its proposals.

Under the control of *Nivas* the number of factories at work was cut down from 179 in 1930 to 37 in 1936; the harvested area from over 494,200 acres to less than 74,130 acres, and the output from 2.9 million tons to less than 0.5 million. At the same time steps were taken to stimulate local consumption. By then, however, the depression was lifting, and in September 1937, the position of planters was further strengthened by the London Sugar Convention, aiming at the adjustment of supply and demand. Arrangements were made for increased supplies to the Netherlands and India, and exports rose from 880,000 tons in 1936, of which the Netherlands took only 5,900 tons and India 107,100, to 1.37 million tons in 1939, of which the Netherlands took 124,300 tons and India 431,500. The number of factories at work in 1939 rose to eighty-four and the output to 1.56 million tons.

Tea. Another important product seriously affected by the depression was tea. Here the crisis was aggravated by the competition of native producers, who sold large quantities of tea to the European planters. Partly on this account an attempt at voluntary restriction in 1930 proved ineffective, and producers remained at the mercy of the market. Their increasing difficulties, and the success attending the regulation of tin and sugar, weakened the prejudice against State control, and in December 1932 the producers of the Netherlands Indies joined with those of India and Ceylon in a plan for restriction, to be enforced by the governments concerned. The total world production was rather more than 400,000 tons, and China, Japan, Formosa, Indo-China, Nyasaland and Georgia (U.S.S.R.), which produced some 65,000, remained outside the combine; but half their produce was green China tea and not competitive. The plan adopted was much the same as for other products. A basic standard was fixed in accordance with actual production during recent years, and export quotas were to be fixed annually by a percentage reduction of the basic standard. The agreement was to be in force for five years, during which the governments undertook to prohibit exports in excess of the quota, and to prevent new

planting, except in special cases. The Netherlands Indies took as its basis the export of 79,000 tons in 1931, and for the first year the exports were not to exceed 85 % of the standard.

The government gave effect to this agreement in June 1933 by the Tea Planting Ordinance, the Tea Export Ordinance and the Tea Export Decree, coming into force retrospectively from 1 April. In August 1933 the Tea Seed Export Ordinance forbade the export of seeds and plants. The standard production for each factory was fixed according to the average yield per acre in 1929, 1931 and 1932, multiplied by the area planted in 1933; and each factory was also allowed to purchase from natives the same quantity of tea as in 1931. The combined total gave the basic standard for each estate, and the quantity for export was calculated by applying to this standard the restriction percentage. Tea production for local sale, and native production other than for sale to the factories, were disregarded. In each regency where tea is grown by natives a committee was appointed to advise on purchases. One effect of restriction was to increase the available supply and thus reduce the price of native tea, and some factories bought it at low rates while selling it at the high rates due to the restriction. A minimum price was therefore fixed for native tea, and purchase at a lower rate was penalised by cancellation of the export licence.

The agreement was followed by a rise of prices, and the export quota for the following year was raised to 87.5 %. Between 1933 and 1938 it ranged between 82.5 and 87.5 %, with a rising tendency as the depression lifted. In 1938 the agreement was renewed for another five years with a quota of 92.5 % for the first year.

The favourable outcome of the plan was partly due to new arrangements for marketing, with larger sales to natives and direct sales to foreign consumers. Formerly, the natives mostly drank cheaper Formosan tea, of which 3,599 tons was imported in 1929. In that year the Tea Export Bureau started a campaign to popularize Java tea, and by 1932 the imports of Formosan tea had fallen to 1,720 tons. As a result of the depression the government took over the Tea Experimental Station, previously maintained by the industry, and, as part of its activities, financed a new campaign for extending native consumption of locally grown tea. The other improvement in marketing was to cut out the middlemen. In 1929 about 70 % of the exports went to the central markets in Amsterdam and London for further distribution. From 1933 onwards exporters sent their produce direct to consuming countries, and by 1939 the exports to

Amsterdam and London dropped to about 25% of the total quantity exported. The reduction in the amount of tea passing through these central markets or 'auctions' was, however, not due primarily to any selective action by the government, but was the result of the imposition of a protective tariff by Great Britain operating against foreign tea. This tariff virtually excluded Netherlands Indies tea from Great Britain, whether shipped direct to London or via Amsterdam, and acted as a powerful incentive to merchants and producers to cultivate markets elsewhere. They were particularly successful in the United States, the countries of the Middle East and Australia, gaining ground at the expense and pained surprise of British Indian and Ceylonese interests.

Rubber. The most difficult problem in the regulation of output and export was that presented by rubber. Not only was native competition much more formidable than in tea, but it was necessary to conciliate international interests, some of which were consumers rather than producers and therefore desired cheap rubber. Moreover, an earlier experiment in restriction had chiefly profited Dutch planters who stood outside it.

During the slump following the war of 1914-18, the price of rubber fell by about two-thirds, and, as voluntary restriction was unsuccessful, the British government appointed a committee under Lord Stevenson to consider regulation. At the end of 1922, with a world consumption of 200,000 tons, the stocks held were over 300,000 tons. The Stevenson Scheme for the restriction of output was accepted by the British government, though the Netherlands Indies refused to co-operate. The consumption of rubber rapidly increased, and by 1928 reached 590,000 tons. Successive and severe cuts in output were nullified by an increasing resort to reclaimed rubber. The use of reclaimed rubber in U.S.A. rose from less than 20% of the total rubber used in 1922 to close on 50% in 1927, and the total production of reclaimed rubber rose to 223,000 tons. The Stevenson Scheme was therefore abandoned in November 1928. The British share of production was 70% when it was introduced and fell to 60% by the time it was given up; meanwhile the output of the Netherlands Indies had doubled and the cost as compared with that in Malaya, though formerly a penny a pound more, was now a penny a pound less.

The abandonment of the Stevenson Scheme was followed by a break in prices, and they dropped still further with the onset of the world economic depression. British interests urged renewal of the

control, but a strong minority of planters in the Netherlands Indies objected, partly because native rubber, which could not easily be controlled, was now a dangerous competitor, and partly because American consumers, interested in low prices, owned some of the estates. During 1933 the output of native rubber was nearly doubled, and prices were still falling. The prejudice against control had weakened, owing to the successful regulation of tin and sugar; in 1934, the Netherlands Indies joined the International Rubber Regulation Committee, and control was introduced from the beginning of June of that year.

The general plan followed the usual lines, except that it was based on potential, instead of actual, production, because trees planted but not yet yielding had to be taken into account. For the Netherlands Indies the basic standard was calculated on an average of the exports for 1929 to 1932, with an allowance for the yield of areas planted between 1925 and 1931, so that the basis, instead of remaining fixed, gradually increased as newly planted areas began to yield. Since then the export quotas have been fixed annually by the international committee by the application of a restriction percentage to the basic standard. In the first instance it was arranged that 71.5 tons of native rubber should be exported for every 100 tons of estate rubber. On the estates restriction was applied individually, but the restriction of native exports, outside Java, was applied by the imposition of a duty at such a rate as might be expected to check production. Despite rigorous enhancement of the duty the output of native rubber continued to increase, and from 1935 the system of individual restriction was extended gradually to native planting until in 1937 this system was made universal. By this means production has been brought under control.

As indicated above, the depression served to stimulate native rubber, owing to the necessity of increasing the quantity sold if, at the lower prices prevailing, the native owner was to secure what seemed to him to be an adequate return. In 1931 native exports were only 53.6% of plantation exports; on the introduction of restriction they were placed at 71.5%, but in practice they have been close on 100%. Native planters have profited also by adopting improved methods of preparation and marketing. Formerly they sold their rubber in wet slabs, but of recent years they have taken to the preparation of rubber in dry sheets. The wet slabs used to be sold in Malaya, but now the native sheet rubber can be shipped direct to the United States and to other consumers (Fig. 62).

Regulation of Monopoly Products

The Netherlands Indies has practically a monopoly of certain products. It produces 90% of the world output of cinchona bark, and exports about 80% of the world supply of pepper and kapok. Like other products, these were badly hit by the depression. The

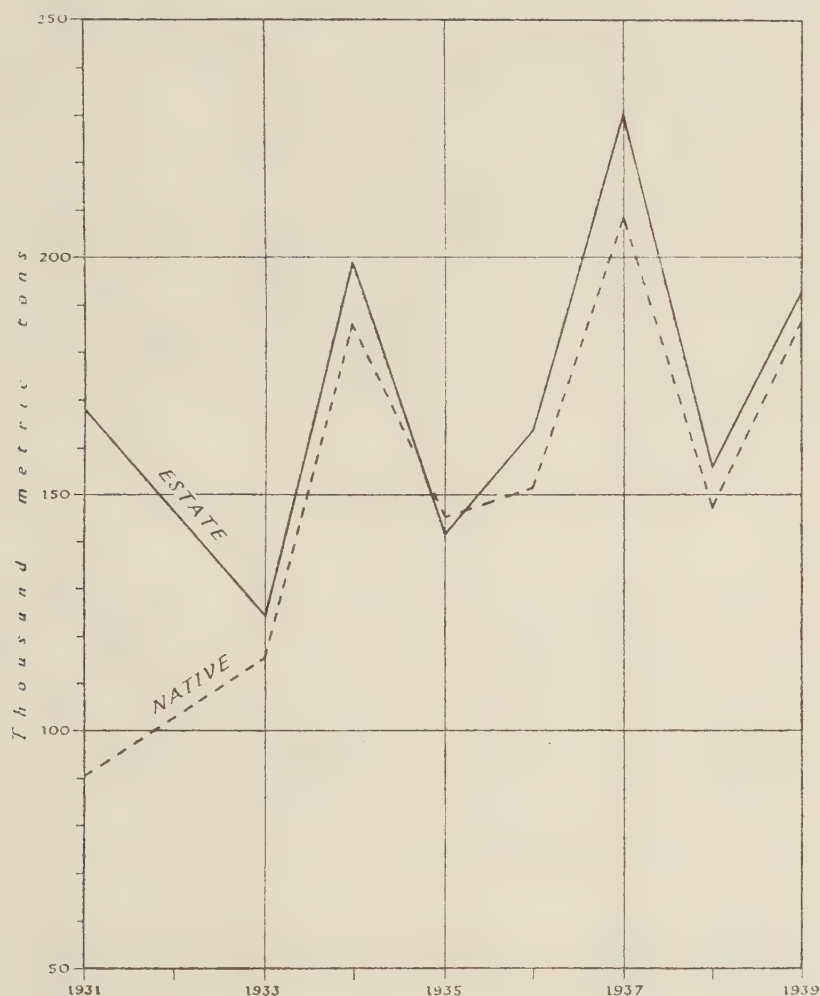


Fig. 62. Rubber exports (estate and native), 1931-39

Source: *Statistical Abstract*, 1940, Table 112.

exports of pepper rose from 31,800 tons in 1931 to 78,000 tons in 1936 but the value fell from £19.8 mil. to £10.7 mil. For cinchona and kapok, the effects of the depression were aggravated by competition, and regulation was thought necessary.

Cinchona. Since 1913 the planters' organization has managed to keep production within profitable limits. New plantations grew up outside the combine, and the natives took to planting cinchona on their homestead plots. Native cinchona was encouraged by the Japanese, who made advances of money on the understanding that they would be repaid in kind, and this threatened to endanger the

monopoly. Moreover the new estates outside the central organization were producing to the limit of their capacity, and could therefore undersell the organized producers who were restricting the yield. In 1933, therefore, production was brought under control by the Cinchona Planting Ordinance, and exports were regulated by the Cinchona Export Ordinance. The plantations were grouped under three heads: those associated with the combine, native plots, and plantations falling under neither of these heads. In the allotment of quotas a technical difficulty arose in fixing a basic standard for plantations which had been practising restriction; finally a maximum was allotted for each group and the group as a whole could dispose of their produce up to this maximum, either by export or by sale to the official quinine factory. New regulations based on this arrangement took effect from the beginning of 1937. The following table illustrates the effect of restriction :

Production and Export of Quinine

	1935		1939	
	Normal Yield*	Export Maximum*	Normal Yield*	Export Maximum*
Combine Plantations	1,424,627	670,987	} 1,371,884	988,313
Outside Plantations	41,727	30,809		
Native Plantations	5,000	4,096		
			9,605	9,065

* Kg. quinine equivalent.

Source: *Statistical Abstract*, 1940, Table 65.

From the above table it is clear that the measures taken have been beneficial both to the planters and the natives. The export maximum allotted to the former has increased by nearly 50%, and to the latter

Export of Bark and Quinine

Year	Bark		Quinine	
	kg. mil.	Value f mil.	kg. (ooo)	Value f ooo
1931	6.0	5.8	54	1,431
1934	6.4	5.1	57	1,399
1939	6.4	7.1	163	4,126

Source: *Statistical Abstract*, 1940, Tables 118 and 119.

by over 100%. At the same time there has been a large increase in the quantity exported without much disturbance of the price.

Kapok. The price of kapok fell by over a half between 1931 and 1935, from f 54.07 per 100 kg. to f 25.54. The low prices and uncertain market were creating a difficult position for producers and exporters, and in May 1935 the Kapok Ordinance was passed to take effect from 1 July. This aimed at stimulating exports by propaganda and by improving the quality, and also tried to obtain a sound price level by the regulation of export and trading, though without restrictions on production. Under this ordinance a central organization was set up to control the export of kapok, and a system of licensing exports up to a prescribed maximum was introduced. The measures were regarded with some misgiving in view of the large part played by native production, but the following year showed a rise both in the quality exported and in the price obtained. In 1937 the price rose to f 44.35 per 100 kg., though the volume of exports declined; in 1939 the same quantity was exported as in 1931, but the price was only f 36.92 per 100 kg.

Regulation of Native Products

The experiment in regulating kapok seemed so successful that the government decided to apply similar measures to other native produce. The chief obstacles were that the numerous petty producers were unable to organize themselves, and that there was no common interest between producers and consumers, so that the whole burden of organization rested on the government.

Coffee had attracted attention from the early years of the depression and, though world production had been reduced, it still remained in excess of consumption, and the output of the Netherlands Indies was increasing. In 1935 the prospects were so unfavourable that measures were drafted to provide a remedy; however, action was postponed. By 1937 world production exceeded consumption by about 50%, and there was a year's supply in stock. Encouraged by the experiment with kapok the government took action along similar lines.

Resins, dammar and copal, and essential oils were permanently threatened by the competition of other tropical lands, and also by synthetic products. Native cassava products and tobacco were suffering from lack of standardization. For all these commodities central export organizations were established in 1937. The general plan on which they work is an examination of the methods of cultivation and of preparation for the market, and of the arrangements with regard to credit and marketing; attention is also paid to the distribution of the product, both at home and abroad, and to the

possibility of increasing sales. The cost of this work is met from a small charge, no more than one-half to one per cent. of the export value. These organizations work in close contact with the civil service and the popular credit institutions.

REGULATION OF IMPORTS

Agricultural Produce

The collapse of agricultural prices in 1930 affected import trade no less severely than export trade, and regulations were made for the protection of agriculture. The chief danger of these regulations was that producers, with their home market secured against outside competition, might relax their efforts to improve their methods.

The leading plantation interests had long maintained experimental stations for technical research and for the study of marketing problems. Many private firms could no longer afford to contribute to the maintenance of these stations, which were therefore taken over by the government under the Crisis Ordinance of 1933. This ordinance enabled the government to set up for each of the interests concerned a central organization to study the improvement of production and devise means of extending markets. It prohibited the transfer of products without a licence from the central organization, and the licence fees were applied to meet the costs of administration.

Rice. In normal times much of the rice comes from Indo-China, Siam and Burma, and in 1930 the large quantity imported from abroad at low prices not only brought down the price of local rice, but threatened to leave rice growers with an unsaleable surplus. In 1931 the Burmese currency was depreciated, and early in 1932 that of Siam, while at the same time the export duties were lowered in Indo-China. These changes aggravated a situation that was already difficult. The first step towards meeting the new danger was a reduction of the freight for rice on the State railways and on the K.P.M. in March 1932. By this time, however, planters were surrendering land that they had rented for sugar, and the natives, instead of cultivating sugar for the planters, were cultivating rice for themselves. Between 1929 and 1932 the area of embanked land under rice increased by more than 494,200 acres. The government decided that the market for this rice must be protected by the regulation of imports, and a provisional ordinance in March 1933 prohibited for four months the import of rice into Java except under licence. In

July the Rice Import Ordinance and Decree confirmed this arrangement for Java, and provided for its extension to the Outer Provinces. In October, the Crisis Export Ordinance empowered the government to control the inter-provincial transport of food supplies, and, as arrangements could be made for provisioning from within the Netherlands Indies, the Outer Provinces were closed to foreign rice. Thus, in 1934 the Oostkust Residency of Sumatra was required to import rice from Java and Lombok instead of from abroad. The general effect of these measures was to cut off local markets from international markets and thereby to enable cultivators to sell their produce. Markets were opened or closed as occasion required. With the increased production of food crops in the Outer Provinces, and with the extension of colonization and irrigation, in future the Netherlands Indies should be practically independent of foreign rice.

Soya Beans. Until 1934 soya beans were imported from Manchuria. Home production had been rising, as soya beans can be grown on land made available by the restriction of sugar-growing, and consequently the area under soya beans increased by 123,000 acres between 1929 and 1932. In order to ensure a local market, imports have been prohibited except under licence, since 1934.

Manufactured Goods

The regulation of imports, introduced originally to protect the local rice market, was soon afterwards applied to another purpose, the protection of local industries. Shortly before the onset of the depression there was a modest beginning in the direction of industrial development, which had long been regarded as a means of enhancing native welfare (see Chapter IX). The world economic depression gave a powerful stimulus to this development, for, when local produce could not be sold, foreign produce could not be bought, and goods previously imported could be obtained only if manufactured locally. Europeans and natives started numerous workshops, large and small, and foreign organizations set up branch establishments in Java. Then in 1931 the devaluation of the yen flooded the market with Japanese goods which threatened the extinction of these new industries.

The government could not easily resort to a protective tariff because of the long-standing tradition of free trade, and still more because of treaties, applying both to the Netherlands and the colonies, containing a 'most-favoured nation' clause. Resort was had therefore to the restriction of imports. In June 1933 restrictions were

imposed on the import of cement, and in September of this year the Crisis Import Ordinance provided for a general extension of this policy. The system of regulation by reciprocal agreements was, however, found more helpful, and tended to replace the mere restriction of imports. In these various ways the new industries were enabled to survive and to a considerable extent the import of finished articles was replaced by the import of raw materials needed for manufactures. The depreciation of the guilder in 1936 enabled local industry to compete with imported products on more favourable terms, though this advantage was to some extent counterbalanced by the higher price of the commodities used in making them.

A danger inherent in these regulation schemes, the unduly rapid extension of certain new industries, was met by the Regulation of Industries Ordinance of 1934. This empowered the government to make the establishment of new enterprises, or the enlargement of existing works, conditional on the possession of a special permit. In 1935 this ordinance was applied to the warehouse and printing trades and, in the vicinity of Bandoeng, to dairy farming. In the following year it was extended to the cigarette industry, the manufacture of metal cooking utensils, to weaving mills and ice factories, and subsequently to rubber smoke-houses in Sumatra and West-Borneo, and to the smaller weaving factories. In 1937, however, it was replaced by a new ordinance under the same title, which enabled the government to prevent the establishment of industries prejudicial to general economic welfare, such as large heavily capitalized enterprises, that might oust important native industries.

REGULATION OF FOREIGN TRADE BY RECIPROCAL AGREEMENTS

The Crisis Import Ordinance of 1933 made it possible to prohibit the import of specified goods in excess of a stipulated quantity, value, or weight. The original idea was to restrict imports by fixing a maximum and leaving importers free to obtain goods at the lowest price without regard to their origin. This device protected local goods in the home market, but it failed to secure them an outlet in the foreign market, and had no effect on the balance of trade with particular countries. Attempts to sell goods abroad by economical production and lower prices were of no avail because they were met by higher tariffs, and this difficulty was enhanced because some countries that sold large quantities of goods bought little.

Since 1913 there has been a general change in the course of trade.

By 1928 imports from Europe had fallen by 10% and exports to Asia had fallen by 6%. As a result of the depression and especially of the devaluation of the yen, this tendency received a new impulse. In 1928 about half the imports still came from Europe and a little over one-third from Asia; by 1933 this position was reversed; during the same period exports to Asia fell still further, and exports to Europe rose. Japan was chiefly responsible for the change. In 1913 the imports from Japan were 1.6% of the total; in 1928, 9.5% and in 1933, 31.0%. In 1934 it was practically impossible to name any category of goods in which European and American industry could compete with that of Japan. But Japan did nothing to relieve the Netherlands Indies of the difficulty of disposing of its products.

The situation threatened disaster to the Netherlands textile industry, and at the same time the Netherlands Indies had a surplus of maize. In 1933 an arrangement was made for the exchange of cotton goods and maize. The Crisis Import Ordinance made it possible to extend this system of barter. Although originally designed merely for the general restriction of particular commodities, it did not exclude a system of quotas by countries, fixing the maximum imports under certain heads from specified countries. These quotas were allotted on condition that countries supplying goods should take the produce of the Netherlands Indies in exchange, and arrangements along these lines were made with the Netherlands, Great Britain, Denmark and Italy.

In addition to the allocation of quotas, commercial agreements on the principle of reciprocity were made with Germany, Great Britain and Poland. These commercial agreements, however, were not always satisfactory. Some countries, notably Germany, were more ready to buy goods than to pay for them. Formerly, the Netherlands and the Netherlands Indies together bought more from Germany than they sold; in 1934, when the Netherlands arranged with Germany for a centralized system for the settlement of mutual credits and debits, covering goods both from the home country and the Netherlands Indies, it was anticipated that imports from Germany would fully cover the cost of exports to that country. But imports from Germany declined and at the end of the year Germany owed *f* 8.5 millions. This was equivalent to an involuntary and undesired investment of Dutch capital in Germany. In view of this new feature in the regulation of exchanges an attempt was made to restrict exports within the limits of Germany's capacity for repayment. With that object a Crisis Export Bureau was established in the Netherlands;

export quotas were fixed for specified products, and the right of payment from the central clearing fund was made conditional on the possession of a certificate from the bureau. Yet by 1935 the debit balance had risen to *f* 24 millions and a year later to *f* 41 millions. The clearing agreement lapsed in 1937, but was renewed with minor modifications, and under a new commercial treaty a number of import quotas were allotted to Germany in consideration of concessions with regard to the imports of coffee, copra, palm oil, tea and tobacco. Other clearing agreements were made with Chile, Turkey, Roumania, and Italy. In 1936 the home government in recognition of the support given in the quota system to Dutch manufactures made a free grant of *f* 35 millions to the Netherlands Indies to be used as a 'Welfare Fund'.

Before the depression Dutch, British and Chinese interests had long dominated the shipping, importing and distribution of foreign goods. With the first flood of Japanese imports, the Dutch firms attempted to stem the tide by refusing to deal in them. The ring, however, was broken by Chinese merchants, who seized the opportunity of making extra profits, and their Dutch competitors not only had to deal in Japanese goods or lose all their trade, but found it necessary to set up agencies in Japan, through which they could import Japanese goods in Dutch vessels. Within a year or so, the Japanese were supplying a third of the total value of imports and tried to strengthen their hold over economic life still further by requiring that Japanese goods should be sent in Japanese ships and imported and distributed through Japanese firms. This threatened the existence of established mercantile interests.

A first step towards meeting the new danger was the insertion in quota agreements of a provision that imports covered by the quota should be handled by specified firms. But this gave protection only in particular cases, whereas the danger was general. In 1935, therefore, the Import Licencing Ordinance was passed with the object of extending this condition to all imports instead of merely to those imported under quota. It was applied in the first instance to enamel wares, various sorts of glass-ware, bicycles and accessories, cutlery, petrol lamps, toothbrushes, and cotton piece goods. Under the new ordinance the import of all these goods was made conditional on the possession of a licence, and the licences were distributed among approved importers. In the following year this system was extended to fifty-three groups of commodities, and covered a large proportion of the total imports.

BIBLIOGRAPHICAL NOTE

1. The historical aspect of commerce is described by J. S. Furnivall in *Netherlands India* (Cambridge, 1939); recent developments are discussed by G. H. C. Hart, *Towards Economic Democracy in the Netherlands Indies* (New York, 1942). The *Indisch Verslag*, published annually at Batavia, gives statistics for each year.
2. Other useful works are J. O. M. Broek, *Economic Development of the Netherlands Indies* (New York, 1942); J. J. van Gelderen, *The Recent Development of Economic Foreign Policy in the Netherlands East Indies* (London, 1939); E. D. van Walree, *Economic Relations of the Netherlands Indies with other Far Eastern Countries* (Amsterdam, 1935), and A. Weytzell de Wilde and J. Th. Moll, *The Netherlands Indies during the Depression* (Amsterdam, 1936).
3. The Department of Overseas Trade has issued several reports, the most recent of which is *Economic Conditions in the Netherlands East Indies* (London, 1938).

Chapter XII

FINANCE

Monetary System: The Budget: Incidence of Taxation: Banking and Credit:
Capital Investments: Bibliographical Note

MONETARY SYSTEM

Since the restoration of Dutch rule in 1816 the ordinary measure of value has been the guilder (*gulden*), known also as the florin. Under the Culture System, the excessive issue of copper coins at a rate above their intrinsic value caused a progressive depreciation of the currency until the introduction in 1846 of a silver-exchange system linking the guilder of the Netherlands Indies with that of the Netherlands. In 1854 the Currency Law made the Dutch guilder legal tender in the Netherlands Indies. The Dutch currency was then still based on silver, but in 1875 a gold ten-guilder piece was introduced and, as this was the only coin that could be freely minted, the effect was to base the currency on gold. The silver coinage remained common to both countries, and the gold standard applied therefore to the Netherlands Indies also, though the ten-guilder piece was not introduced into the colony until 1877.

In 1912, when the finances of the Netherlands and the colony were separated, the existing system was confirmed in the Netherlands Indies Currency Act. With a view to providing against losses on demonetization this act established a coinage fund to be derived from the profit on minting coins of nominal value and of small change. After the outbreak of war in 1914 the government had to abandon the gold standard, and in 1919 the shortage of silver led to the introduction of currency notes to supplement the supply of silver coins. At the same time, owing to the rise in the value of silver, the proportion of fineness was reduced from 945/1000 to 720/1000. The gold standard was restored in 1925 and in 1927 it was decided to withdraw the currency notes from circulation when new silver coins of the lower standard of fineness should become available to take their place. During the economic crisis, though almost every country had to devalue its currency, the Netherlands, and therefore the Netherlands Indies, adhered to the gold bloc. In September

1936, however, when France and Switzerland went off gold, the Netherlands was compelled to place an embargo on the export of gold, but it refrained from fixing any new gold value for the coinage and established an Exchange Equalization Fund to regulate the international value of the guilder. The Netherlands Indies still remained linked to the Dutch guilder. The German occupation (1940) broke the link with the Netherlands, and the colonial government therefore took measures to protect its monetary system and maintain the Netherlands Indies guilder as independent valuta.

The following coins are in legal circulation:

Gold Coins: 10-guilder (*f* 10) piece; 6.720 grammes, 900 fine; 5-guilder piece, of half the weight.

These coins, though of unlimited tender, are never seen in ordinary transactions.

Silver Coins: (a) of unlimited legal tender. Rijksdaalder (*f* 2.50), guilder (*f* 1.0) and half-guilder (*f* 0.50), weighing respectively 25, 10 and 5 grams and, now, of 720/1000 fineness.

(b) of limited legal tender. Quarter-guilder (*kwartje*) and one-tenth guilder (*dubbeltje*) or ten cents (*f* 0.10).

The nickel and copper coins, all of limited legal tender, are:

Nickel: the 5 cent piece (*f* 0.05)

Copper: the $2\frac{1}{2}$, 1 and $\frac{1}{2}$ cent pieces.

The coins of unlimited tender are identical with those current in the Netherlands; the remainder differ somewhat in design from the corresponding coins of the Netherlands but have hitherto all been minted at Utrecht.

In parts of the Outer Provinces various other coins are in daily use among the people, notably in Bali, where Chinese 'cash' (*kepeng*) are an ordinary medium of exchange. These were found very useful when abnormally low prices obtained during the world economic depression.

Besides the currency notes, notes issued by the Java Bank are also legal tender. They are available for amounts ranging from *f* 5.0 to *f* 1000, and are payable at the bank in either gold or silver at the option of the bank. The issue of bank notes is protected by a regulation that the bank must retain cover in specie or bullion to 40% of the dues payable on demand.

THE BUDGET

The Constitution of 1854 prescribed that the finances of the Netherlands Indies should be regulated by law. Provision was made for this

in the Accounts Law (*Comptabiliteitswet*) of 1864. Under this law the budget for the Netherlands Indies came annually before the States-General. The trend of policy in the direction of decentralization led in 1912 to the financial independence of the colony. Since that date the Netherlands Indies has had full legal power to raise loans and to dispose of its surplus revenue; but the budget continued to be debated and finally settled in the States-General.

In the accounts as presented in official returns, a distinction is made between ordinary and extraordinary expenses and receipts. For the period between 1867, when the Accounts Law first took effect, and 1911, the last year of financial subordination, the ordinary service showed a profit of *f* 301,103 and the extraordinary service a debit of *f* 353,013 leaving a debit balance of *f* 51,910. The Netherlands Indies also took over the balance outstanding from the Netherlands State loans of 1883 and 1898 that had been raised, partly or wholly, on behalf of the colony. Against these liabilities could be set the railways and other public works and services that were rapidly becoming more remunerative.

Expenditure and Receipts, 1912-38

Year	Expenditure (thousand <i>f</i>)	Receipts (thousand <i>f</i>)	Balance (thousand <i>f</i>)
1912	269,025	270,550	1,525
1913	327,071	311,354	-15,717
1914	343,943	281,726	-32,217
1915	347,887	309,734	-38,153
1916	373,049	343,127	-29,922
1917	420,403	360,139	-60,264
1918	512,573	399,724	-112,849
1919	721,186	543,097	-178,089
1920	1,060,435	756,362	-304,073
1921	1,056,016	791,763	-264,253
1922	851,258	752,578	-98,680
1923	710,793	650,448	-60,345
1924	666,138	717,939	51,801
1925	682,854	754,849	70,995
1926	751,069	807,853	56,784
1927	775,858	779,052	3,194
1928	845,765	835,917	-9,848
1929	904,593	848,529	-56,064
1930	893,540	755,552	-137,988
1931	767,062	652,009	-115,053
1932	631,826	501,815	-130,011
1933	554,068	460,642	-93,426
1934	509,269	455,180	-54,089
1935	480,192	466,739	-13,453
1936	508,376	537,495	29,119
1937	566,930	571,719	4,789
1938	682,366	578,601	-103,765

Source: *Indisch Verslag*, 1938, vol. II, p. 431 (Batavia, 1938).

Expenditure rose with the development of welfare services and the extension of administration in the Outer Provinces. During the war of 1914-18 deficits accumulated and continued to accumulate until 1924. During the next few years revenue rose and the appearance of prosperity encouraged further expenditure until, with the onset of the world economic depression, deficits again began to accumulate. Expenditure was then reduced until in 1935 it was little more than half what it was in 1929. In 1936 with the improvement in trade a credit balance was once more obtained, but by 1938 expenditure on preparations for war had increased to such an extent that there was again a deficit.

Revenue

Until quite recently the revenue returns comprised five major heads: Taxation, Monopolies, Products, Enterprises and Miscellaneous. The Monopolies covered opium, salt, and pawnshops. The Products consisted of agricultural, forest, and mineral produce obtained by the government from State property, or as revenue in kind. The Enterprises were the State railways, postal business and similar activities. The Miscellaneous receipts came mostly from concerns in which the State had a joint interest, or a share in the profits. The revenue accruing under these various heads is shown below.

Growth of Net Revenue, 1867-1937 (f millions)

Year	Taxation	Monopolies	Products	Enterprises	Misc.	Total
1867	25.5	14.1	38.5	0.8	—	77.3
1897	52.9	24.5	10.6	3.7	—	91.7
1913	102.8	35.5	33.8	11.0	6.8	189.9
1927	321.9	51.4	72.2	41.8	31.1	518.4
1937	284.8	19.3	18.9	12.2	29.9	365.3

Source: *Indisch Verslag* (Batavia) for several years.

Under the Culture System most of the revenue was derived from the sale of produce cultivated by the people on behalf of the government. In 1867 half the revenue still came from this source. Thirty years later the revenue under this head was comparatively unimportant, but it tended to rise subsequently with the introduction of scientific methods in the State mines. The revenue from monopolies grew as administration became more efficient, but from about 1900, while continuing to rise, it became relatively less important owing to the more rapid growth of revenue under other heads. In 1867 the State had not yet begun to construct railways and the few enterprises were conducted at a loss, but in subsequent years there was a gradual but steady rise under this head until returns were affected by the

depression. But the outstanding feature is the increasing dependence on taxation as a source of revenue. In 1867 it furnished only one-third of the total; thirty years later, though the total gross revenue was only *f* 130 million, as against *f* 137.5 million in 1867, the proportion of net revenues derived from taxation rose to 58%. In subsequent years it remained about the same until the depression raised it to 78%. This illustrates forcibly one characteristic feature of the revenue system. When the conjuncture is unfavourable the revenue from products, monopolies and enterprises automatically declines; so also does part of the revenue from taxation, such as customs and excise duties. To meet necessary expenses the government is compelled, therefore, to derive a larger proportion of its revenue from sources which are under its control, and must provide out of taxation for expenditure which in more favourable circumstances would be largely covered by the income from its various activities.

During recent years the revenue returns have been compiled on a new system. From about the beginning of the century it was felt that the accounts should be prepared on more business-like principles, and commercial book-keeping was introduced in connection with various branches of the administration. A further step in this direction was taken in the Industries Law of 1927 which provided for the separation of the commercial enterprises of the government from the general account. From 1930 onwards this law has gradually been extended to various enterprises and the main heads of account are now: Taxes, Surplus from Industries within the Industries Act, Surpluses from other Industries, and Miscellaneous Receipts. The following statement shows the revenue for 1937 under these heads.

Revenue of the Netherlands Indies, 1937

TAXATION		thousand guilders
Land Revenue		22,520
Taxes on Income		75,578
Customs and Excise		156,266
Taxes on Property		20,862
Miscellaneous		9,623
Total		284,849
PROFITS FROM STATE ENTERPRISES		50,527
MISCELLANEOUS RECEIPTS		29,957
TOTAL		365,333

Source: *Indisch Verslag*, 1938, vol. II, pp. 436-40 (Batavia, 1938).

Expenditure

A notable feature of the expenditure during the first quarter of the present century was the rapid increase of expenditure on native welfare and especially on education. In 1895, out of an allotment of about *f* 3 million for education, only one-third went to natives, whereas in 1931 the European share was of minor importance. Other contributions towards educational expenditure were made by local authorities. The depression occasioned a great reduction in welfare expenditure, but local authorities did much to relieve the situation.

The main heads of expenditure are given below with details for 1931, just as the first impact of the depression was being felt, and for 1937, when recovery had begun.

Expenditure

	1931 (<i>f</i> 000)	1937 (<i>f</i> 000)
Central Government	4,172	2,946
Judicial Department	15,719	10,995
Financial Department: General	118,349	70,258
Debt Service	76,063	79,830
Internal Administration	84,030	64,897
Education and Religion: Education	49,294	18,879
Religion	63	1,030
Public Health	19,079	8,121
Economic Affairs	22,928	4,047
Traffic and Public Works		9,106
War Department	*66,957	55,657
Marine Department	*35,128	12,845

* Figures for 1932.

Source: *Indisch Verslag*, 1932 and 1938, vol. II, p. 449 (Batavia, 1932 and 1938).

State Debt

At the outbreak of the war of 1914-18 there was still a balance outstanding on the loans of 1883 and 1898. These had been raised at home at the rate of 3%. Deficits during the war entailed further borrowing and the floating debt was consolidated by loans raised successively in 1915, 1916 and 1917 at the rate of 5%. The slump after the war of 1914-18 caused a further succession of loans between 1921 and 1923 at 5% to 6%. By 1930 the consolidated debts totalled *f* 1.06 million with a floating debt of *f* 101.167 million; most of this had been raised at 5% or more. With the deficits consequent on the depression the position rapidly grew worse, and by 1933 the total debt amounted to *f* 1,522 million, of which *f* 261.4 million was due

on short-term borrowing. But the depression also allowed of conversion at favourable rates. A conversion loan was raised in 1935 at $3\frac{1}{2}\%$, and in 1937 the bulk of the outstandings were converted into loans at the rate of 3% . At the end of that year the total debt had

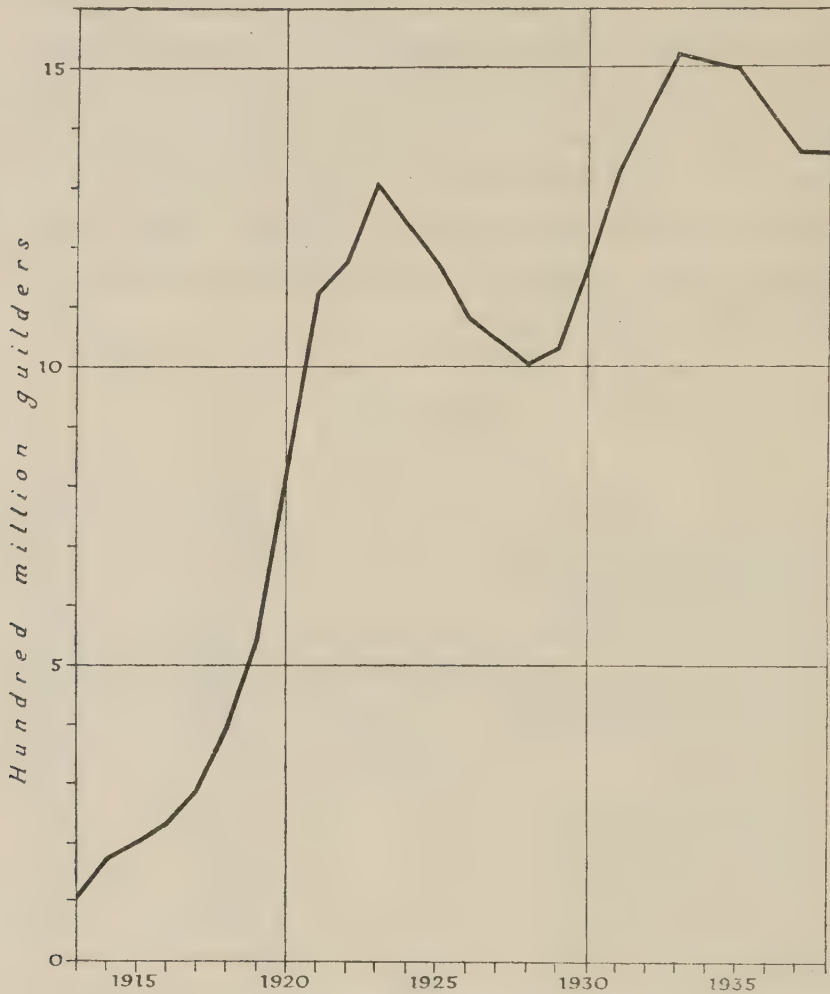


Fig. 63. State debt, 1913-38

Source: *Indisch Verslag*, 1938, vol. II, p. 434 (Batavia, 1938).

been reduced to *f* 1,358 million of which all except *f* 34.2 million was in long-term bonds. By this means interest charges of more than *f* 60 million in 1933 were reduced to *f* 37 million in 1938. Since then long-term bonds have been redeemed, but short-term loans have been raised to meet the deficits, and the official returns for 1940 place the total debt at *f* 1,418 million of which *f* 205.8 million represents floating debt on short-term loans.

INCIDENCE OF TAXATION

Under the Culture System (see p. 84), the burden of the revenue fell on the natives of Java because there were few Europeans, and in

the Outer Provinces there was little to tax. In 1867 not only did the natives of Java provide practically all the revenue derived from products and monopolies, but they paid half to three-quarters of the revenue derived from taxation. This arrangement long survived the Culture System. At the beginning of the century it was estimated that natives bore about four-fifths and Europeans and Foreign Orientals only one-fifth of the charges of the State, and that Java paid about 78 per cent. of the total revenue. In view of the opinion, then generally held, that the welfare of the natives of Java was diminishing, attempts were made to shift the burden of taxation from Java to the Outer Provinces and from the native cultivator to other classes.

Very little could be done to readjust the distribution of taxation between Java and the Outer Provinces so long as a wide discrepancy remained between their relative taxable capacity. By 1916 the share of Java had been reduced to 73 %, but the imposition of new taxation after the war brought the proportion up to 78·5 %. Since then the development of oil and rubber and the decline of sugar have increased the taxable capacity of the Outer Provinces and also in some degree diminished that of Java, with a corresponding readjustment of their shares in the burden of revenue, but there seems to be no recent authoritative estimate of the result.

The shifting of the incidence of taxation from the native to other classes can be examined with greater certainty. The land revenue and capitation tax are paid only by natives; to the taxes on income the native contribution is negligible; natives pay about half the import duties, and most of the excise duties. Thus the following table illustrates the shifting of taxation from natives to Europeans, and, as regards the native share, a shift from direct or compulsory to indirect or voluntary taxation.

Heads of Taxation, 1867-1937

Year	Land Revenue, Capitation, etc.		Income and Companies Tax, etc.		Customs and Excise		Other heads		Total
	<i>f</i> mil.	%	<i>f</i> mil.	%	<i>f</i> mil.	%	<i>f</i> mil.	%	
1867	12·6	49	—	—	7·6	30	5·3	21	25·5
1897	20·8	39	—	—	15·8	30	16·3	31	52·9
1913	25·2	25	10·9	11	39·7	39	27·0	25	102·8
1927	35·9	11	107·7	33	129·6	41	48·7	15	321·9
1937	22·5	8	75·4	26	156·3	56	29·4	10	284·8

Based on official sources.

BANKING AND CREDIT

The oldest institution that carries on banking operations in the Netherlands Indies is the Netherlands Trading Company (*Nederlandsche Handels Maatschappij*—known as N.H.M.) founded with government support in 1824. But this, as the name implies, was originally interested in commerce, and the first bank, founded as such, was the Java Bank, which was constituted in 1828 with a capital of f 1 million, subscribed almost entirely by the government and the N.H.M. in equal shares. For some years its activities were hampered by restrictions on its power to issue notes, but in 1875 it was granted full discretion in this matter, subject to the proviso that it should maintain a cover of 40% in specie or bullion. The government supervises the management and receives a fixed proportion of the profits. One of the main functions of the bank has been to regulate the rate of exchange by controlling shipments of specie and by payments from the gold reserve; in this matter it acts in close co-operation with the Netherlands Bank. As a 'bankers bank', it dominates the colonial money market. It also carries on ordinary banking business at numerous agencies throughout the Netherlands Indies.

From about 1850, with the dawn of private enterprise in Java, there arose a demand for capital which was met in the first instance mainly by the N.H.M. which thus became the first of the so-called 'Culture Banks'. This term, though prominent in the financial history of the Netherlands Indies, is a misnomer, as the institutions to which it was applied specialized in financing agricultural enterprises without conducting the ordinary business of banking. The profits of the N.H.M. attracted numerous imitators, especially after the great stimulus to enterprise given by the agrarian legislation of 1870. Competition encouraged unsound finance, and, when a crisis shook credit in 1884, many of the Culture Banks failed. Since 1880 the N.H.M. had taken to ordinary banking; it was therefore able, together with the Java Bank and support from capitalists at home, to restore confidence. Most of the Culture Banks were reconstructed on sounder lines as subordinate concerns linked up with normal banking institutions on a much larger scale with their headquarters in the Netherlands.

The banks as then reorganized are still in existence. Besides the Java Bank and the N.H.M. they include the *Nederlandsch-Indische Escompto Mij* and the *Nederlandsch-Indische Handelsbank*. The former, founded in 1857, with the modest capital of f 0.5 million

worked on orthodox banking lines and was little affected by the crisis of 1884. The latter, founded in 1863, was reconstructed in 1884, when its agricultural interests were taken over by the Netherlands Indies Agricultural Company, with which it is still associated. The N.H.M. still has a branch dealing with agriculture. From 1900 to 1930 there was a great development of banking, but the depression led to a general reduction of capital.

Paid up Capital (f millions)

Bank	1900	1930	1937
Java Bank	—	9·0	9·0
N.H.M.	36·7	80·0	40·0
N. I. Escompto Mij.	3·0	47·0	13·5
N. I. Handelsbank	7·2	55·0	33·0

Based on official sources.

Among British banks are the Chartered Bank of India, Australia and China, and the Hong Kong and Shanghai Banking Corporation. The Mercantile Bank of India had two branches, but both are now closed. Before the war of 1914-18 French capital was represented by the Banque de l'Indochine. The Japanese opened a branch of the Bank of Taiwan in 1915, and some years later the Yokohama Specie Bank and Mitsui Bank opened branches. Another development of the present century has been the formation of modern banks by the Chinese; among the earliest of these were the Bataviasche Bank, the Deli Bank, the Chung Wah Bank and the Oei Tiong Ham. The China and Southern Bank was a joint Chinese and Japanese foundation. As an outcome of the nationalist movement the *Bank Nasional Indonesia* was formed to act as an agricultural bank for native enterprises.

Savings Banks

The general provision of credit by the government in the popular credit institutions has already been described (see p. 219). Other institutions are designed mainly to encourage thrift; some of these are merely savings banks (*spaarbanken*) and others, the provident banks (*hulpbanken*), are active in granting petty advances. The earliest savings bank dates back to 1853, and four others followed at intervals up to 1879. Later the government became more active in promoting thrift, and between 1891 and 1903 eight savings and provident banks were founded, in addition to the Postal Savings Bank.

The Postal Savings Bank dates from 1898 when the deposits during the year were *f* 0.86 million. In 1930 they were *f* 17.24 million and, by 1937, despite the depression, *f* 28.15 million. The total amount deposited at the end of 1938 was *f* 42.10 million, including *f* 26.4 million from 87,337 Europeans, *f* 11.7 million from 185,479 natives, and *f* 4.0 million from 32,572 Foreign Orientals. There were eight other savings banks in which the deposits totalled *f* 13.45 million, of which *f* 0.26 stood to the credit of 10,962 Europeans, *f* 0.58 million to the credit of 3,159 natives, and *f* 1.78 million to the credit of 2,888 Foreign Orientals. The balance represented deposits by institutions. The four provident banks had a combined capital of *f* 110,900 million and made loans to the extent of *f* 152,688.

Pawnshops

When about 1900 the government embarked on a systematic campaign for the promotion of native welfare, one matter that engaged its attention was the management of the pawnshops. These had long been farmed out to Chinese, who were thought to be exercising a pernicious influence on native life and especially to be using the pawnshops as surreptitious opium dens. After careful enquiry and experiment the government decided to take them over and has gradually built up a very successful pawnshop service. The people obtain money on much more advantageous terms than from the Chinese; there is a fairer valuation, the rates of interest are lower, the clients are assured of the protection of their interests, and better care is taken of the pledges. The profit to the State has sometimes exceeded *f* 10 million a year, and during the first twenty-five years amounted to nearly *f* 150 million.

In the Netherlands Indies, as elsewhere in the East, the pawnshop is a general convenience and not merely the resort of the poor man in distress. In times of prosperity the shops are filled with a variety of goods; especially noticeable is the large number of bicycles pawned by the villagers for safe custody during the rains. In 1930, before the Netherlands Indies felt the impact of the depression, the loans granted in Java and the Outer Provinces amounted respectively to *f* 171.7 million and *f* 22.4 million. With the rapid decline of prices, the pledges, even after a very cautious valuation, often came to be worth less than the money lent on them, and many remained unredeemed. New loans were granted at lower rates and in 1936 the loans granted in Java were no more than *f* 55.1 million and in the Outer Provinces *f* 10.3 million. At the same time the number of

loans granted fell by about one-half. With the gradual emergence from the depression both the number of loans made and the total advances again began to rise.

CAPITAL INVESTMENTS

Under the Culture System methods of production were primitive and there was little need for capital; the State was one vast business enterprise and supplied all the capital that was required. With the transition to private enterprise capital was needed, at first on a modest scale, and, from 1870 onwards, to a much greater extent. For some years the Netherlands provided almost all the capital that was needed, chiefly for sugar in Java, for tobacco in Sumatra and for the construction of railways and tramways. In addition to the capital required for business investments in private enterprise, the government needed funds for the prosecution of the Atjeh War, and for the construction of State railways and other public works. These were provided by State loans issued by the Netherlands on behalf of the Netherlands Indies in 1883 and 1898, and practically the whole of this public money was Dutch.

The Netherlands did not provide all the capital for private enterprise; some was British. This was indirectly a result of the Culture System. Under that system, the N.H.M., acting on behalf of the government, stifled independent Dutch merchants and shippers, and British merchants who wanted Java produce otherwise than through Amsterdam had to maintain local agencies in Java. Thus, when the trade was thrown open, the British firms were in possession of the field. British banks opened branches in Java to meet the requirements of their fellow countrymen, and the country was thus linked up with British capital. A further tie was established from 1873 onwards when British planters introduced Assam tea. Then in 1898 the money for developing the oilfields of Borneo could not be raised in the Netherlands, and the Shell Company was created by financiers in London. Thus by 1900 there was a considerable amount of British capital invested in the Netherlands Indies. There was also, on a very much smaller scale, German and Swiss capital invested in tobacco in Sumatra.

From about 1900 capital became much more international in character, and at about the same time the Outer Provinces were being opened up as a field for investments in new products, especially rubber and palm oil. In Java, Dutch interests continued to preponderate, as sugar was far more important than all other products

together and this was wholly controlled by the Dutch, or by Chinese-Dutch subjects. Even in Java, by 1912 out of 101 rubber companies fifty were in British hands. In the Outer Provinces, however, and especially the Oostkust Residency of Sumatra, almost half the total capital invested in agriculture was alien. The Standard Oil Company of New York had obtained a footing in the oil business through the N.K.P.M., founded in 1912; and American and French interests had obtained a considerable holding in the Royal Dutch Oil Company.

The war of 1914-18 gave the Dutch an opportunity to improve their position, but even in 1929 the foreign capital invested in crops, other than sugar, was still over 40% of the total. By this time Japanese investments in agricultural enterprise were arousing misgivings and in 1930 the Japanese invaded the oil industry by taking over a concession for the Borneo Oil Co. The following table gives an estimate of the position in 1937:

Business Capital, 1937

	<i>f</i> thousands
Dutch	2,250
British	500
Chinese	350
American	233
French	90
Japanese	30
German	25
Italian	25
Belgian	22
	<hr/>
Total	3,525
	<hr/>

Source: H. G. Callis, *Foreign Capital in South-east Asia*, p. 36 (New York, 1941).

The Dutch investments in agricultural enterprises may be put at about *f* 1,500 million of which sugar and rubber each account for a third. In coffee and tobacco the Dutch have the largest holding, about *f* 150 million. The capital invested in quinine and in palm oil is predominantly Dutch. The Dutch government owns, directly or indirectly, the whole tin industry, and about *f* 500 million in the oil industry. Bauxite and nickel are wholly Dutch. Capital invested in shipping, railways, tramways and airways is predominantly Dutch, and so also is that invested in the recent industrial development. British capital is mainly interested in oil, rubber, tea and tobacco. American capital has gone chiefly into oil and rubber. The three greatest rubber manufacturing companies of America and

the world, the United States Rubber Company, the Firestone Tyre and Rubber Company, and the Goodyear Tyre and Rubber Company, hold large estates with a view to making themselves independent of foreign producers. The Germans were interested in tea, coffee, oil palms and rubber, and also in many industrial and commercial enterprises. The Japanese have for some time held sugar, tea and oil palm estates and about 1930 were interested in oil and rubber. The Italians, French and Belgians have rubber and oil-palm estates. Chinese interests are very widely scattered over almost every line of production and commerce, but their chief investments are in sugar.

The growth of investment in public securities since 1900 has been no less striking. In 1900 it was confined to two State loans. Since then it has risen, not only on account of new loans contracted by the State, but also through loans raised by municipalities and other local authorities. Some of these have included foreign money. In 1929 there were upwards of *f* 425 million of the Netherlands Indies bonds held by Americans, but by 1935 the American holding had dropped to about *f* 60 million of long-term corporation bonds. Government bonds to the value of over *f* 30 million were held in England in 1930, but probably most of these had been disposed of before the outbreak of war. By far the greater part of the public securities has always been held by the Dutch, and it is estimated that before the war at least 80% was in Dutch hands. The following table shows the growth of investment in public securities and in business enterprise between 1900 and 1937.

Growth of Investment (f million)

Year	Public Securities	Business Enterprise
1900	45	750
1914	170	1,700
1930	1,000	4,000
1937	2,150	3,525

Source: H. G. Callis, *op. cit.* p. 39.

In connection with these foreign investments certain matters deserve special notice. One is that international capital engaged in material development is far less sensitive to native aspirations and less interested in permanent welfare than Dutch capital invested in public funds. Another is that during periods of depression the foreign investors cease to earn profits, while even in hard times the State must continue to pay interest on its debts.

BIBLIOGRAPHICAL NOTE

The most recent works dealing with various aspects of the finance of the Netherlands Indies are J. H. Boeke, *The Structure of Netherlands Indian Economy* (New York, 1942), H. G. Callis, *Foreign Capital in South-east Asia* (New York, 1941) and P. H. W. Sitsen, *Industrial Development of the Netherlands Indies* (New York, 1943). Statistics are given in the *Indisch Verslag*, published annually at Batavia.

Chapter XIII

PORTS

Introduction: Ports of Java—Batavia (Tandjoengpriok); Cheribon; Tegal; Pekalongan; Semarang; Soerabaja; Pasoeroean; Probolinggo; Panaroekan; Kalianget; Banjoewangi; Tjilatjap: Ports of Sumatra—Sabang; Oeleëlheuë; Pangkalanbrandan (Pangkalansoesoe); Belawan; Tandjoengbalai; Laboehanbilik; Rengat; Djambi; Palembang; Belinjoe; Soengailiat; Tandjoengpandan; Teloekbetoeng; Padang (Emmahaven); Sibolga: Ports of Borneo—Pontianak; Bandjermasin; Balikpapan; Lingkas (Tarakan): Ports of Celebes and the Moluccas—Makassar; Manado; Amboina: Bibliographical Note

INTRODUCTION

The ports of the Netherlands Indies have grown up in response to the rapid economic development which has taken place in the islands mainly since the middle of last century and more particularly since the beginning of the present century. Formerly most ships were able to find shelter in the coastal inlets which served as natural harbours, but when the size of ships increased, the bars at the mouths of many of the rivers compelled the larger ships either to anchor in the roadsteads until the tide would take them in, or else, to discharge their passengers and goods by native boats. The cutting of channels through the bars was only a makeshift and in 1910 the government decided to introduce direct unloading into custom houses and godowns by the provision of quays and piers in deep water. In the following year effect was given to this decision by placing the harbour administration under a special Port Service as a branch of the Department of Civil Public Works. In 1934 the ports were made over to the newly constituted Department of Communications and Public Works (*Verkeer en Waterstaat*). The ports of Batavia (Tandjoengpriok), Soerabaja and Semarang in Java, Belawan and Padang (Emmahaven) in Sumatra and Makassar in Celebes are each under the authority of a Director appointed by this department. The Director is assisted by a port commission (*Commissie van Bijstand*), representing the industrial and commercial interests. The administration of most of the other ports is supervised by one of these five Directors: thus Cheribon, Pekalongan and Tegal are under the Director of Semarang, and Tandjoengbalai and Pangkalansoesoe are under the Director of Belawan. On the other

hand, certain ports, such as Palembang and Djambi in Sumatra and Manado in Celebes, are directly under the Department of Communications and Public Works.

The seas and straits surrounding the islands of the East Indies lie at the crossroads of the world shipping routes which link India and the West with the Far East and Australia. Most of the shipping lines converge on Penang and Singapore in Malaya rather than upon the

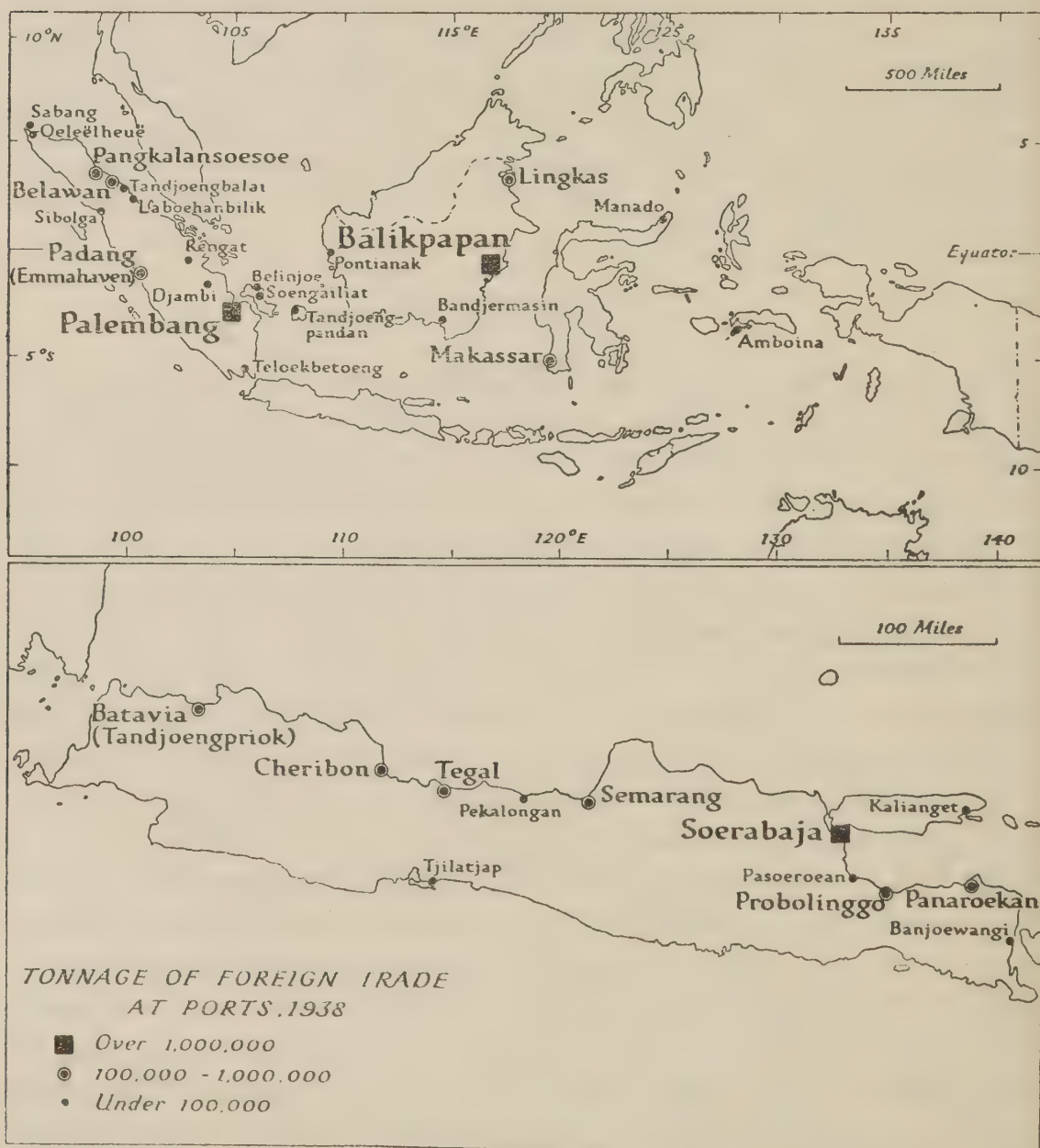


Fig. 64. Tonnage of foreign trade at ports, 1938

Source: *Jaaroverzicht van den in -en uitvoer van Nederlandsch-Indië Gedurende het jaar, 1938*, vol. I, p. 7, vol. II, p. 7 (Batavia, 1939).

ports of the Netherlands Indies, though ships of many nations call at the ports along the north coast of Java on their way to or from

Port Activities, 1938

Ports	Tonnage Shipping (Foreign and Coastwise)	Tonnage Merchandize (Foreign only)
JAVA:		
Soerabaja	5,302,479	1,145,590
Batavia (Tandjoengpriok)	5,973,480	646,777
Semarang	4,893,312	548,187
Cheribon	2,697,326	224,816
Tegal	1,182,473	193,270
Panaroekan	1,205,651	144,463
Probolinggo	1,212,116	119,091
Tjilatjap	405,305	92,110
Kalianget	—	63,955
Pasoeroean	690,618	58,136
Banjoewangi	968,791	51,212
Pekalongan	705,634	43,846
SUMATRA:		
Palembang	2,504,914	3,109,594
Pangkalanbrandan (Pang- kalansoesoe)	—	836,985
Belawan	3,531,694	563,635
Sabang	2,327,962	—
Oeleëlheuë	132,915	—
Padang (Emmahaven)	932,496	99,033
Tandjoengbalai	—	82,759
Teloekbetoeng (Oost- haven)	1,079,131	62,419
Laboehanbilik	—	51,203
Djambi	137,268	49,225
Tandjoengpandan	383,151	28,917
Rengat	—	20,836
Soengailiat	—	17,345
Sibolga	183,938	14,029
Belinjoe	—	9,627
BORNEO:		
Balikpapan	1,889,741	1,870,515
Lingkas (Tarakan)	487,467	682,839
Pontianak	205,339	120,161
Bandjermasin	211,195	52,974
CELEBES AND THE MOLUCCAS:		
Makassar	2,424,800	354,775
Manado	568,017	42,342
Amboina	248,250	—
Others	702,548	1,596,549
	43,188,011	12,997,815

Source: 1. *Jaaroverzicht van den in-en uitvoer van Nederlandsch-Indië Gedurende het jaar 1938*, vol. I, p. 7, vol. II, p. 7 (Batavia, 1939).

2. *Statistiek van de Scheepvaart in Nederlandsch-Indië over het jaar 1938*, pp. 80-97 (Batavia, 1939).

Australia. Few vessels, except those of Dutch nationality, touch at the ports of the Outer Provinces. In external communications with the Far East, Australia, Europe and America the leading Dutch shipping firms are the *Koninklijke Paketvaart Mij.* (K.P.M.), *Rotterdamsche-Lloyd*, *Java-China-Japan Lijn*, and *Nederland Stoomvaart Mij.*; in the considerable local traffic between the islands the K.P.M. holds the predominant position (see pp. 443-6).

Navigation in the seas and in the approaches to the ports is usually not difficult, though conditions naturally vary over an area so vast as the Netherlands Indies. The monsoon winds, which blow throughout the whole region, seldom interfere seriously with shipping, for the wind velocities are low and gales rare. Strong winds and squalls occur locally between the monsoons. In the Malacca strait storms known as *Sumatras* are experienced during the period of the west monsoon, while in the Celebes sea the development of the squally *Barat* winds sometimes interrupts communication with the roadstead at Manado. Visibility is generally good, except during periods of heavy rainfall when it becomes much restricted over a limited area, and in long spells of dry weather when haze is prevalent.

The tides along the shores are variable in periodicity. They are semi-diurnal on the coasts open to the Indian ocean, whereas in most parts of the Java sea they are diurnal. In Makassar strait the tides are semi-diurnal off Poelau Laoet, but diurnal off Makassar. The rise in the tides is generally small so the need for wet docks does not arise. The tidal streams are usually weak in open waters, but in contracted passages such as the Soenda strait they may attain a rate of over nine knots.

The official statistics of the Netherlands Indies list thirty-four ports (see table on p. 341, and Fig. 64), each of which will be described in geographical order in each island or island group. While many roadsteads provide reasonably good anchorage for fleets, berthing accommodation alongside quays and wharves is restricted to a few ports, such as Batavia (Tandjoengpriok), Soerabaja, Belawan, Balikpapan and Makassar. On the basis of tonnage of goods entered and cleared, the oil ports of Palembang and Balikpapan hold first place; in tonnage of shipping and in value of goods entered and cleared Batavia (Tandjoengpriok), Soerabaja, Semarang and Belawan are far ahead of the other ports. There is a well-equipped naval base at Soerabaja.

In addition to the large ports there are upwards of 450 minor ones, none of which has sufficient importance to warrant separate treatment.

Some of the minor ports are referred to briefly in vol. I of this Handbook.

PORTS OF JAVA

In Java, the three ports of Soerabaja, Batavia (Tandjoengpriok) and Semarang each handle a total annual foreign trade of over half-a-million tons, while the annual tonnage of shipping entered and cleared at each of these ports exceeds four and a half million tons. They serve the agricultural regions of the northern coastal plains and interior basins. The nine other ports mentioned in the official statistics are much less important with respect both to the amounts of merchandise and of shipping. Apart from Tjilatjap, the only important harbour on the south coast, and the small port of Banjoe-wangi on Bali strait, all the ports are at or near the mouths of rivers which flow into the Java sea.

BATAVIA (TANDJOENGPRIOK)

Lat. $6^{\circ} 06' S$, Long. $106^{\circ} 52' E$. Population 533,015 (1930)

Admiralty Chart 1653a. Figs. 65, 66. Plates 61-68.

Batavia, the capital and largest city of the Netherlands Indies, and its port of Tandjoengpriok are situated on the north coast of Java at the head of the bay between the two low promontories of Tg. Pasir and Og. Krawang. Tandjoengpriok, which lies five miles north-east of the town, handles the bulk of the trade of western Java, and is a place of transshipment for goods from the Outer Provinces. It is also a port of call on international routes and vessels of many nations are seen at its wharves.

Approach and Access

The seaward approach to Batavia is made by way of two channels known as the Inner and Outer Channels, between the Java coast and the Duizend-eilanden. The outer channel, marked by lights, passes near the islands of Babi and Edam; this is the route commonly taken, since it can be followed by vessels at all times of the day and night and is less dangerous to shipping than the inner channel which runs nearer to the coast. Vessels approaching the port from Bangka strait follow a course eastward of the Duizend-eilanden keeping to the west of Edam island at the entrance to Batavia bay. Og. Krawang at the eastern side of the bay is extending out to sea and vessels

proceeding from the east and north-west give it a wide berth. There is good holding ground everywhere in the channels of approach to the port. The most frequently used anchorage is north of Tandjoengpriok harbour, in depths of $5\frac{1}{2}$ to 7 fm. Another anchorage is available in 5 to 6 fm. off the old harbour of Batavia.

Diurnal tides are experienced, that is, there is one high and one low water every 24 hours. The mean rise and fall is only $1\frac{1}{2}$ ft., which is insufficient to affect berthing of vessels at the quays.

Tandjoengpriok is accessible to ships of 29 ft. draught at all states of the tide. The old harbour at Batavia is only used by small vessels and native boats (Plate 66).

Detailed Description

The port of Tandjoengpriok consists of an outer harbour and a number of basins. The outer harbour, which encloses a water area of about 350 acres, is formed by two stone breakwaters, extending seawards in a northerly direction and converging to give an entrance 180 yards wide. A channel with a depth of 31 ft. at low water is maintained by dredging; vessels unable to get a berth in the basins moor to buoys, aligned on either side of the fairway.

The inner harbour comprises a prau harbour and three basins, all of which are entered from the outer harbour and lie in a north-south direction. The prau harbour, to the west of the three basins, is in direct communication with Batavia by a ship-canal; both harbour and canal are only used by small vessels. Of the three main basins, No. 1 Basin is 3,500 ft. long and 600 ft. wide with a depth of 30 ft. at its entrance. The western and southern sides are quayed, with depths alongside of 27 ft. and 9 ft. respectively. Near the entrance on the eastern side are two government piers; between these piers and the entrance to the Java Canal, which runs parallel with the first and second basins, is the naval quay and a cattle wharf. The depth of water alongside is 27 ft. South of the entrance to the canal a new quay 656 ft. in length is under construction. A line of warping buoys runs down the middle of the basin.

No. 1 Basin is used mostly by the steamers of the K.P.M., the Burns-Philp line and smaller steamers of many nationalities. The Java Canal has a depth of 7 ft. and is used by lighters. The post, telegraph and harbour offices are situated near the railway station on the western side of this harbour (Plate 61).

No. 2 Basin is 3,300 ft. long and 480 ft. wide; there are depths of 30 ft. at its entrance and alongside the western and eastern quays.

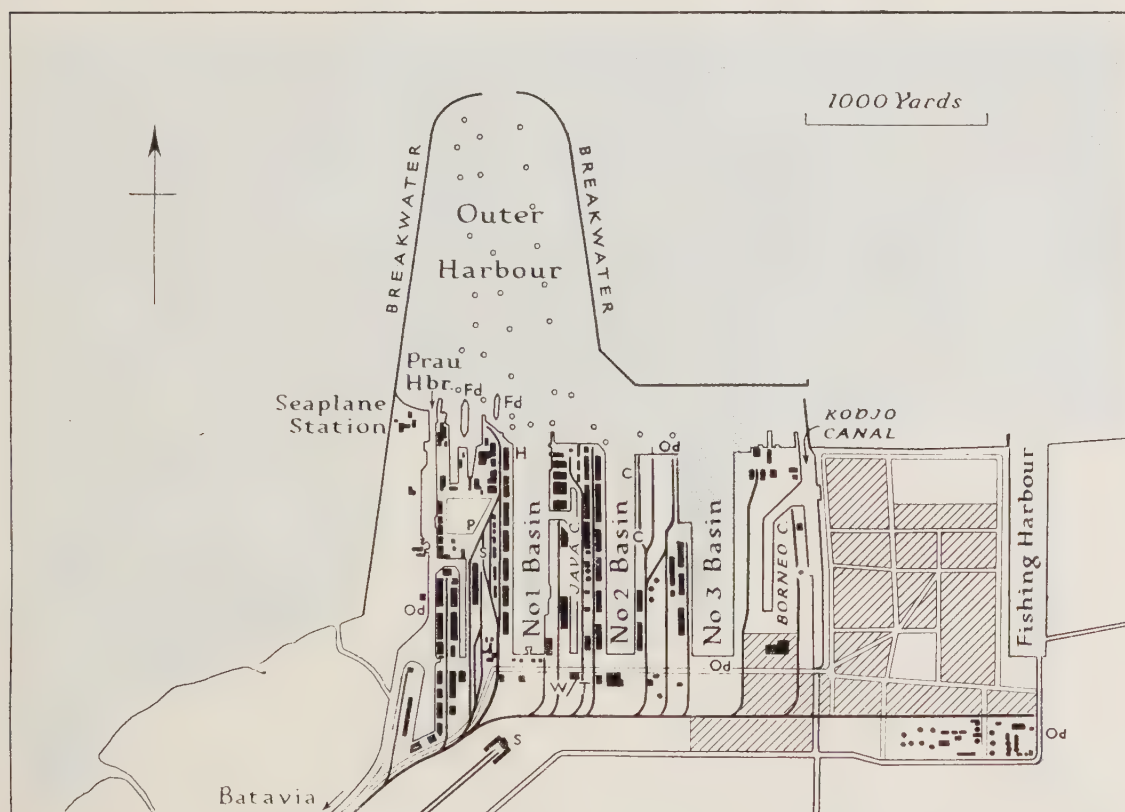
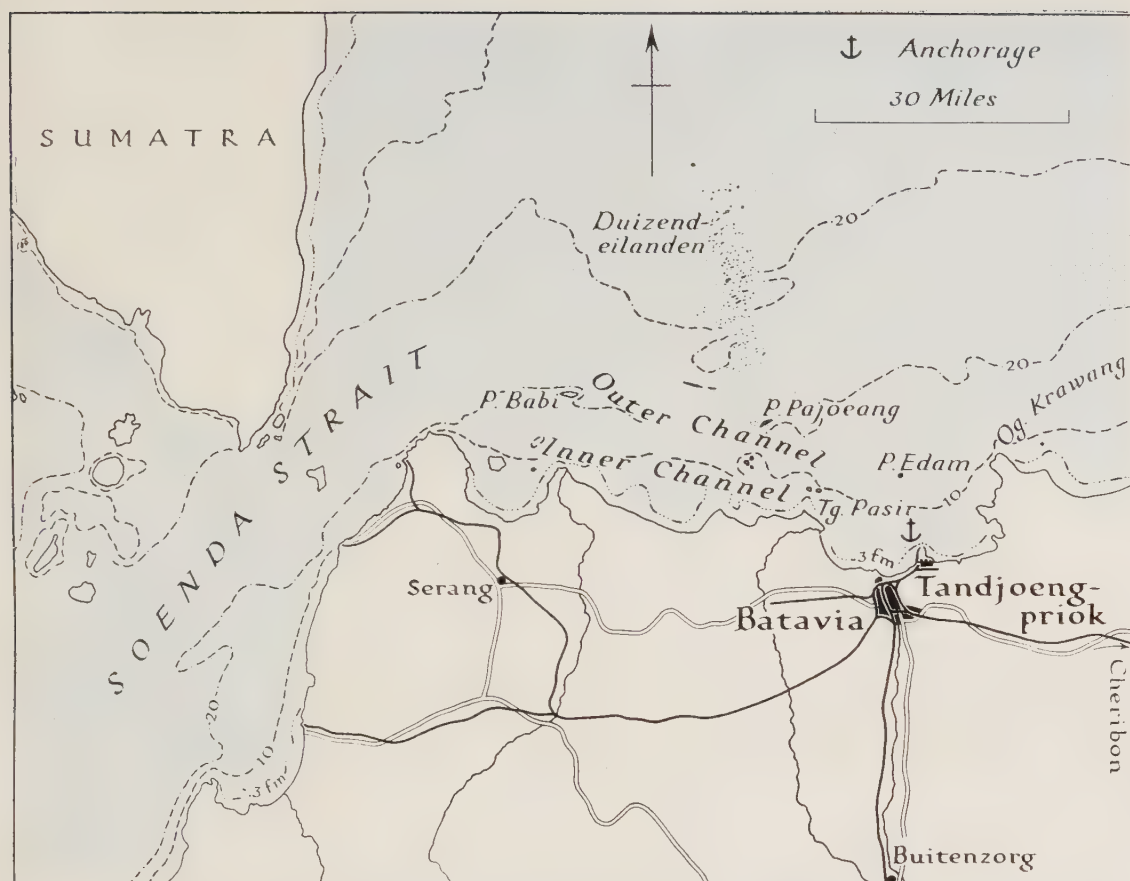


Fig. 65. Batavia (Tandjoengpriok)

C. Coal store; Fd. Floating dock; H. Harbour master's office; Od. Oil depot;
P. Post office; S. Railway station.

Source: (1) Admiralty Chart 1653A (1934, corrected to 1939); (2) Official sources.



Fig. 66. Batavia

1. Court of Justice; 2. Town hall; 3. Prison; 4. Theatre; 5. Palace of Governor-General; 6. Citadel Prins Hendrik; 7. Post office; 8. Kemajoran airfield; 9. Koningsplein; 10. Race course; 11. Museum; 12. Residence of Governor of West-Java; 13. Medical school; 14. Railway workshops (Manggarai); H. Hospital; S. Railway station.

Source: (1) Official sources; (2) *Atlas van Tropisch Nederland*, plate 23 (Batavia, 1938).

As there are no warping buoys in this basin tugs are employed by vessels going alongside and leaving the wharves. On the western side are the quays of the *Nederland Stoomvaart Mij.*, *Rotterdamsche-Lloyd* and *Java-China-Japan Lijn*; near the entrance on the eastern side are a number of coal wharves. On the outer end of the strip of land between the second and third inner harbours is a petroleum pier with a depth of 27 ft. at its head (Plate 62).

No. 3 Basin is not yet completed; along its western side is a quay 1,640 ft. long with a water depth of 32 ft. East of this basin are the Borneo and Kodjo canals, which have been cut to link the oil establishments of the *Bataafsche Petroleum Maatschappij* (B.P.M.) and the *Nederlandsche Koloniale Petroleum Mij.* (N.K.P.M.) with the sea. Three petroleum piers lie near the entrance to these canals. A little further east and running parallel with the three inner basins is a harbour for fishing boats.

Port Facilities

The port has three floating cranes with lifting capacity of 75 tons, 15 tons and 10 tons, respectively, and twenty-five electric cranes of between 3 and 10 tons. There are also nine other cranes, with lifting capacities varying from 3 to 50 tons. Most of the cranes are found on the western sides of the No. 1 and No. 2 Basins.

Well-constructed warehouses line the sides of the No. 1 and No. 2 Basins and also occupy the space of land between the No. 1 Basin and the prau harbour. These cover an area of 130,165 sq. ft. and provide ample storage accommodation. The quays and warehouses are all served by branch lines from the main railway to Batavia.

Harbour craft of the port includes six sea-going tugs, owned by the *Nederlandsch-Indië Steenkolen Handel Mij.* (N.I.S.H.M.), and a number of lighters and barges. The harbour department owns two salvage vessels.

Large stocks of coal and oil are available for fuelling. The coaling wharves lie on the eastern side of No. 2 Basin; four mechanical grabs enable loading to be carried out at the rate of about 600 tons an hour. Fuel oil is taken in at the two petroleum piers near the entrance to No. 1 and No. 2 Basins and also at certain berths in each of the three basins. On an average, 100 tons of oil an hour can be taken in alongside and 60 tons an hour from lighters. Pipe-lines connect the main quays of the inner harbour with the storage depots of the B.P.M. and N.K.P.M. These depots lie east of No. 3 Basin; there are other tanks

alongside the Java Canal and the prau harbour. The capacity of the tanks for the different kinds of oil is as follows:

	<i>Tankage capacity</i> (metric tons)
Fuel oil	34,620
Solar (Diesel) oil	5,575
Kerosine	11,925
Motor spirit	13,310
Aviation spirit	3,925
	<hr/> 69,355 <hr/>

Based on official sources

Water is laid on at the quays and also at the petroleum piers. Five tank boats are available to supply water to ships at anchor. The repairing of vessels is chiefly carried out in two steel floating docks with the following dimensions:

	Length (ft.)	Breadth (ft.)	Depth (ft.)	Lifting capacity (tons)
No. 1 Floating Dock	324	67	20	4,000
No. 2 Floating Dock	514	70	24.6	8,000

Based on official sources.

Both docks lie westward of the entrance to No. 1 Basin; they are owned by the *Tandjoengpriok Droogdok Mij*. This company also owns a patent slip, which has a length of 263 ft. and a lifting power of 2,000 tons. Two small dry docks, the one owned by the government, the other by the N.I.S.H.M., are available for repairs to vessels of shallow draught. In addition to the patent slip there are two slipways belonging to the K.P.M., with the following dimensions:

	Length (ft.)	Breadth (ft.)	Depth (ft.)	Capacity (tons)
No. 1 Slipway	60	26	3	150
No. 2 Slipway	58	26	6	125

Based on official sources.

There are also several other small slipways.

The Town

The town of Batavia lies near the mouth of the Tjiliwoeng about five miles south-west of Tandjoengpriok. It is divided into three



Plate 61. Tandjoengpriok: No. 1 Basin

Steamers of the *Koninklijke Paketvaart Mij.* (K.P.M.) are berthed alongside the quays and moored at warping buoys which run down the middle of the Basin. The western breakwater of the outer harbour appears as a thin line in the background.



Plate 62. Tandjoengpriok: No. 2 Basin

The quays along the western side of this basin are used by steamers of the *Nederlandsche Stoomvaart Mij.*, *Rotterdamsche-Lloyd* and *Java-China-Japan* lines. On the other side of the basin can be seen the four mechanical grabs which facilitate the loading of coal. The Java Canal is on the extreme left of the photograph.

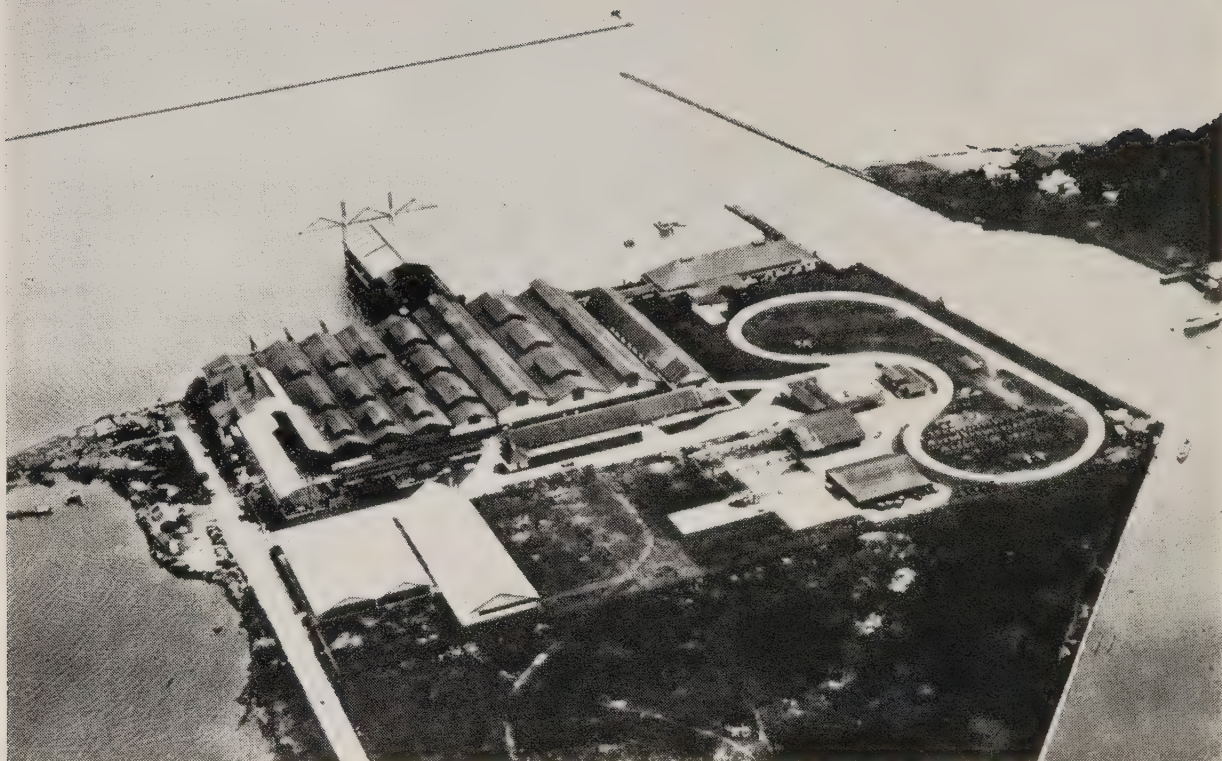


Plate 63. Tandjoengpriok: Assembly plant, General Motors Ltd.

This motor-car factory lies on the narrow strip of land between the No. 3 Basin (left) and the entrance to the Kodjo Canal (right). The assembly plant is in the centre, with the testing track on the right.

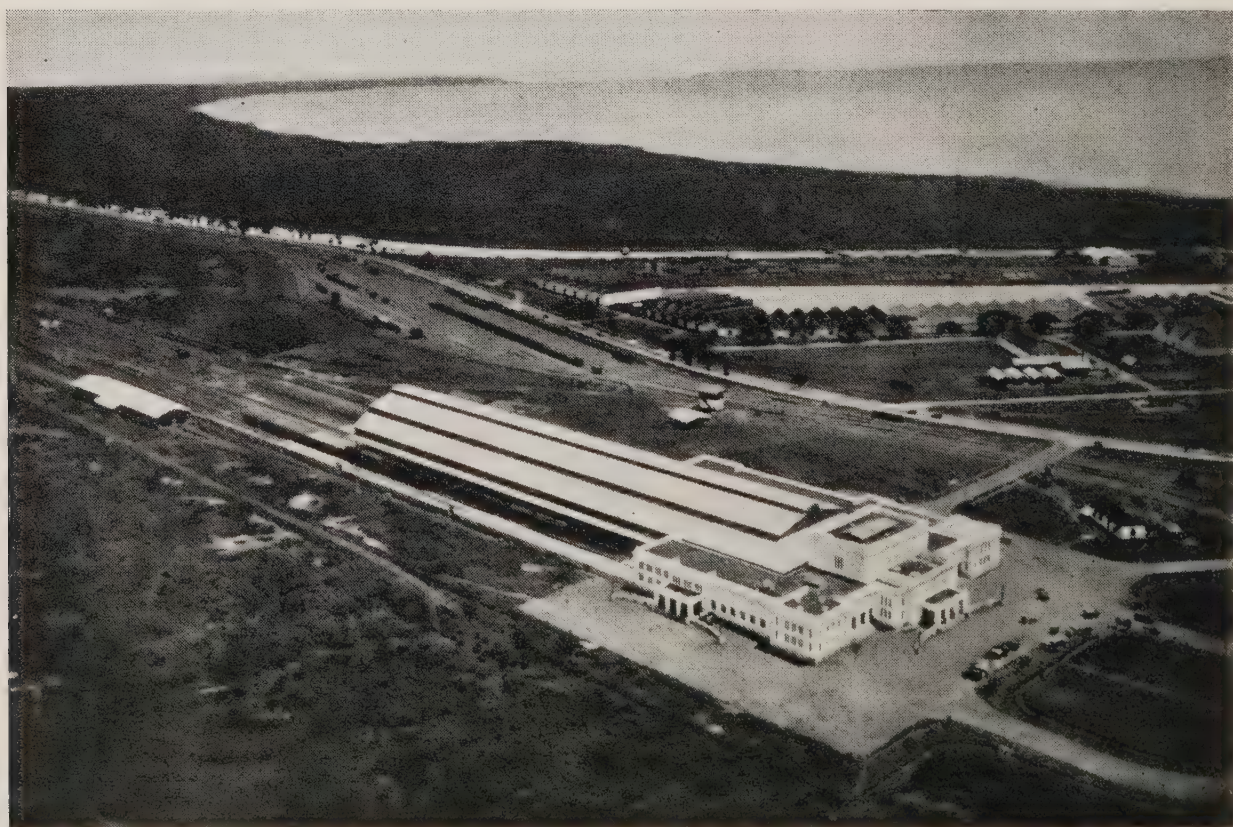


Plate 64. Tandjoengpriok: railway station

The station lies a short distance to the south of the main harbour. The fairly broad stretch of water near the centre of the photograph is the southernmost section of the prau harbour which lies east of the No. 1 Basin. The narrow strip of water which runs across the photograph is the canal linking Tandjoengpriok with Batavia. The bay of Batavia is in the background.

parts, namely, Batavia, Weltevreden, and Meester Cornelis, extending inland from the coast for nearly nine miles. Old Batavia, that is the lower part of the town nearest the sea, was founded by Jan Pieterszoon Coen in 1619 on the site of the native town of Jacatra (see p. 52). It originally stood on the seashore, but is now a mile inland owing to the deposition of river alluvium. At the present day the old town is only inhabited by natives and Chinese, though it is still the principal business centre. Weltevreden, founded by Daendels at the beginning of the nineteenth century on higher ground upstream, has most of the government offices, hotels and houses of the Europeans. The adjacent suburb of Meester Cornelis is mainly a European residential quarter (Plates 67, 68).

Batavia is the capital of the Netherlands Indies and also the seat of government of the province of West-Java.

History

The harbour of Tandjoengpriok was the first artificial harbour to be constructed in the Netherlands Indies. It was begun in 1877 and first opened to shipping nine years later. Since this time the length of quayage and warehouse accommodation has been greatly increased. The first floating dock was made available in 1896, the second in 1923. At the end of 1932 a sum of about 55 million guilders had been devoted to the construction of the harbour and to the provision of port facilities. This figure does not include the costs of constructing the railway from the port to Batavia.

Trade

Tandjoengpriok is the first port of the Netherlands Indies in the value of its foreign trade, but fifth in tonnage of goods handled. In 1938, it handled 646,777 tons of foreign trade, valued at 225,628 guilders. With the exception of Cheribon, Tandjoengpriok is the only important port in Java where imports exceed exports. Nearly half of the exports are plantation products, tea and rubber, and the native crop, cassava, in the form of tapioca. Most of the tea and many of the rubber plantations in Java are found in the hill country to the south of the port. Tandjoengpriok handles almost the whole of the export trade in tea and exports about twice as much rubber as any other port on the island. On the other hand, its export of tapioca, though important, is much smaller than that from Soerabaja or Cheribon. Of the other exports, the chief are petroleum, cement and various mineral products. Among the drugs and spices exported, quinine takes a high place. The item 'foreign produce' in the list of

exports refers to transhipped goods; these mainly include tin, pepper and some forest products.

The imports are divided between primary products, such as minerals, and a great number of manufactured goods. Minerals, of which coal is the chief, make up one-quarter of the imports.

The number and tonnage of ships entering the port increased by nearly 60% between 1920 and 1937. This is shown in the following table.

	Steamships		Sailing vessels	
	No.	Tons	No.	Tons
1920	1,858	3,381,625	2,127	21,554
1925	2,269	4,819,434	2,696	28,268
1934	2,618	5,428,268	3,327	36,395
1935	2,565	5,369,611	3,712	37,801
1936	2,614	5,596,113	2,705	49,469
1937	2,900	5,913,780	2,995	39,929

Source: *Indisch Verslag*, 1938, vol. II, p. 367 (Batavia, 1938).

The K.P.M., *Rotterdamsche-Lloyd*, *Nederland Stoomvaart Mij.* and the *Java-China-Japan Lijn* are the principal shipping firms which use the port.

Industries

Tandjoengpriok has a coal briquette factory and several ship-building and ship-repairing yards. In Batavia, there is a munitions works, several printing shops, two cement and lime factories, thirteen sawmills, three kapok presses, eight pyrotechnic factories, and an oxygen factory.

Communications

The quays of the inner harbour have branch connections with the electric railway from Tandjoengpriok to Batavia. There are two stations at the port; the one lies on the west side of No. 1 Basin and the other lies about a quarter of a mile south of this basin. The main station at Batavia is situated in the centre of the old town. Batavia is linked by railway with all parts of Java. There is an electric and steam tram service from the old part of Batavia to Weltevreden; only the steam tram continues to Meester Cornelis. Tandjoengpriok and Batavia are connected by a canal which is 196 ft. wide and has a minimum depth of 7 ft. (Plate 65). The canal is fed by the Tjiliwoeng. Between this canal and the railway is the main road. Good roads run



Plate 65. Tandjoengpriok—Batavia Canal

This view is taken near to Tandjoengpriok. The cranes in the distance are on the quays of the No. 1 Basin.



Plate 66. Fishing harbour at Batavia

The harbour lies near the mouth of the Tjiliwoeng.

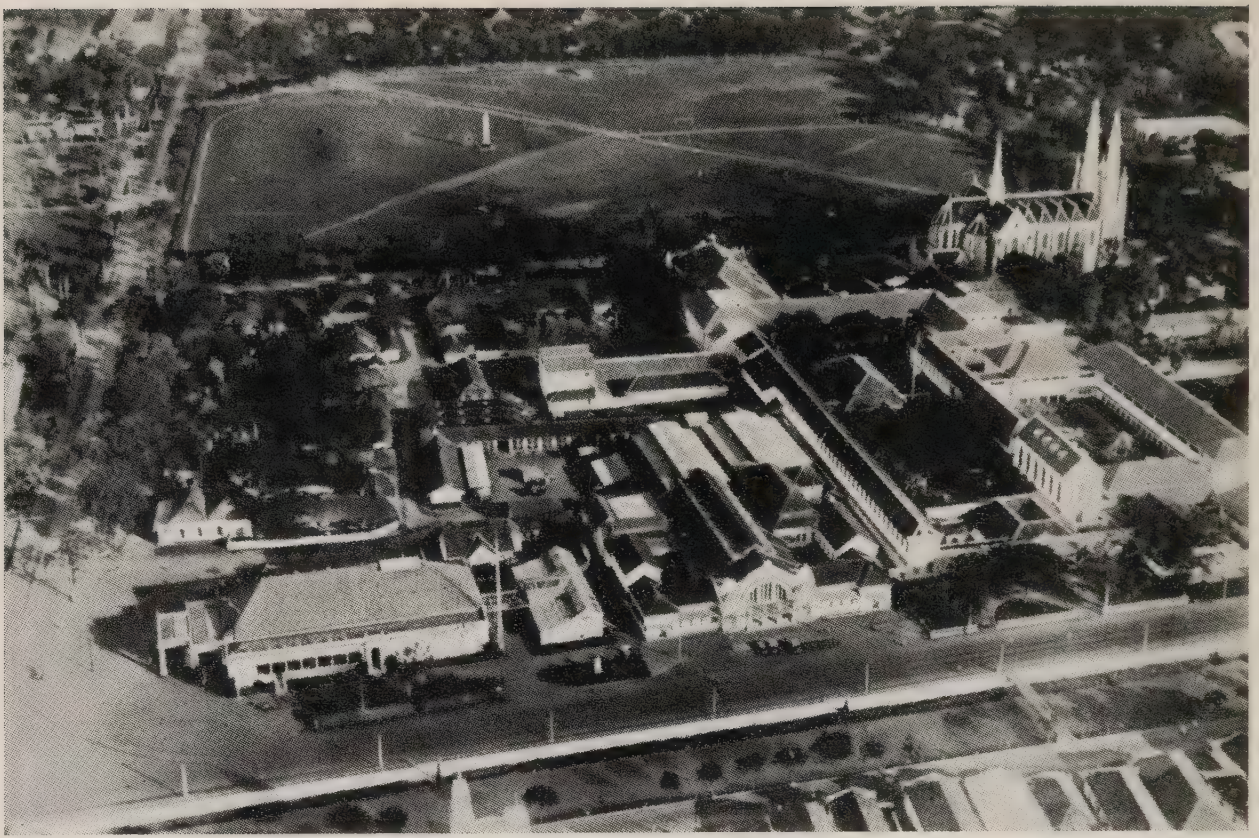


Plate 67. Batavia (Weltevreden): the Waterlooplein

The Waterlooplein is the large open space at the top of the photograph. The white column in the centre of the park was erected in 1828 to commemorate the battle of Waterloo. The building with triple spires is the Roman Catholic church. In the centre foreground is the Post and Telegraph office and to the left of this, the Municipal Theatre.



Plate 68. Batavia (Weltevreden): the railway station

The station lies on the east side of the Koningsplein, part of which is seen in the bottom left-hand corner of the photograph. The large building near the top of the photograph is the head office of the *Koninklijke Paketvaart Mij.* (K.P.M.).

from Batavia to the towns of the northern coastal plain and to the Buitenzorg and Bandoeng regions in the interior.

On the western side of the entrance to the prau harbour at Tandjoengpriok is a seaplane station, with several hangars and repair facilities. To the west of Weltevreden is a civil aerodrome, used by the *Koninklijke Nederlandsche-Indië Luchtvaart Mij.* (K.N.I.L.M.).

CHERIBON

Lat. $6^{\circ} 48' \text{ S}$, Long $108^{\circ} 34' \text{ E}$. Population, 54,079 (1930)

Admiralty Chart 932. Fig. 67.

Cheribon lies on the north coast of Java about halfway between Batavia and Semarang, at the head of a bight marked by the low promontories of Tg. Tanah and Tg. Losari. The port is approached through the centre of the bight, thus avoiding the shallow waters

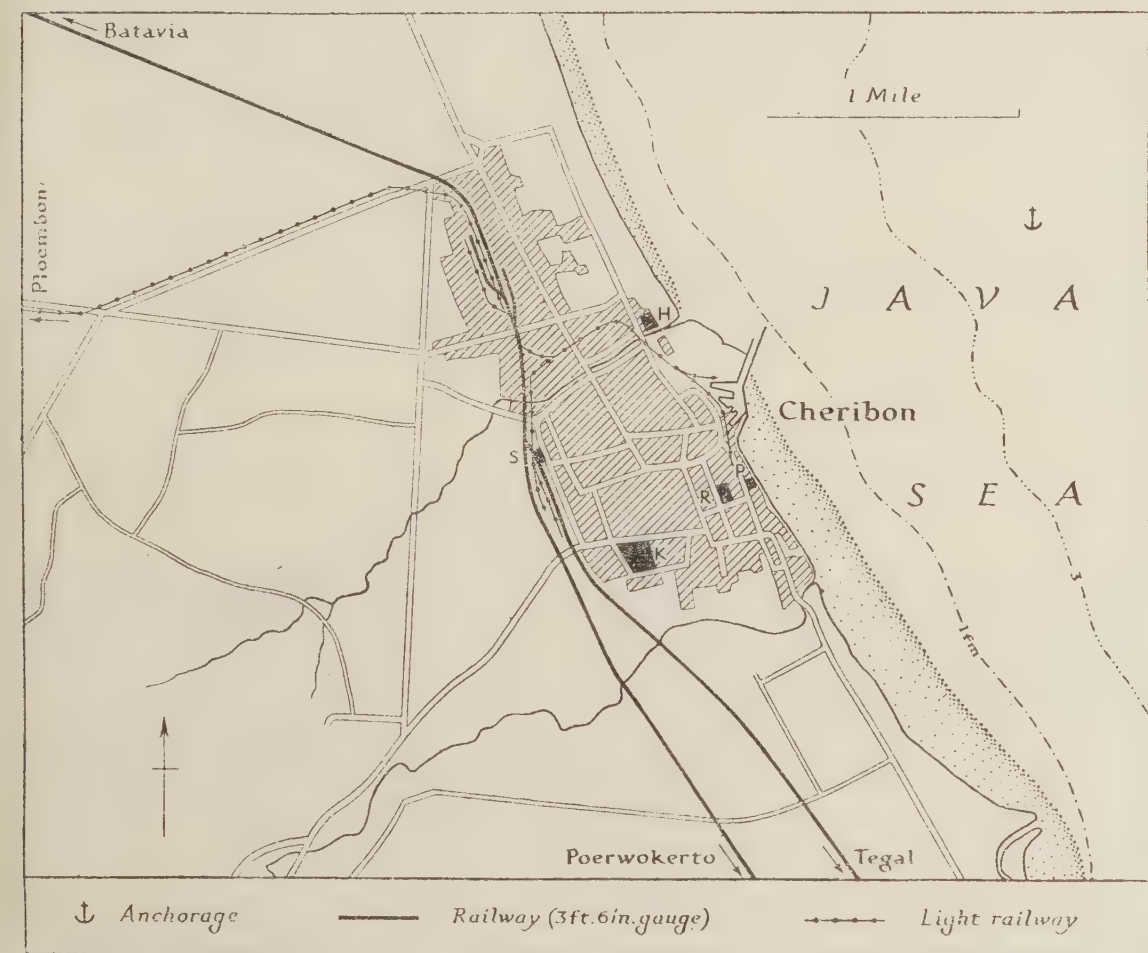


Fig. 67. Cheribon

H. Hospital; K. Kraton (palace of the Sultan); P. Post Office; R. Residency; S. Railway Station.

Source: (1) Admiralty Chart 932 (1912, corrected to 1939); (2) Java and Madura 1 : 50,000 (G.S.G.S. 4202).

south and east of Tg. Tanah. In the roadstead about two miles offshore there is a good anchorage during the west monsoon in depths of from 3 to 4 fm. The tidal rise is slight.

The harbour, which is entered through a dredged channel between two breakwaters, consists of two triangular basins, only available for small vessels. The depths are maintained at from 7 to 8 ft. by dredging. The port facilities include six small cranes and four slipways.

In 1938, Cheribon handled 224,816 tons of goods in its foreign trade, exports comprising 133,446 tons and imports 91,370 tons. The port is the outlet for the densely peopled agricultural districts of the neighbouring coastal plain, and its exports chiefly consist of agricultural foodstuffs such as tapioca and sugar. Manufactured and semi-manufactured goods constitute the bulk of the imports. Vessels of the K.P.M. and of many European lines call regularly at Cheribon roadstead.

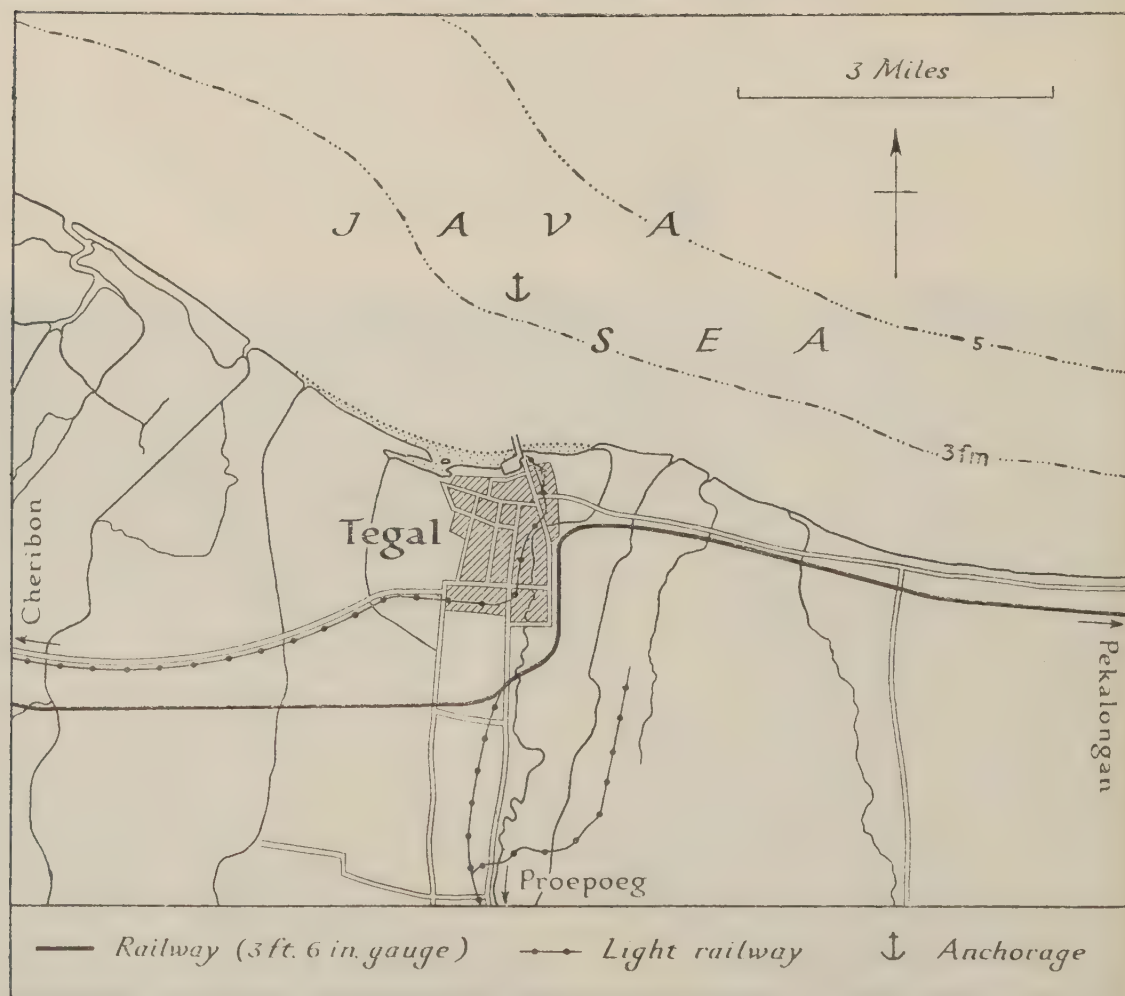


Fig. 68. Tegal

Source: (1) Admiralty Chart 3311 (1902, corrected to 1939); (2) Java and Madura 1 : 50,000 (G.S.G.S. 4202).

Cheribon is connected by railway and road with most parts of Java. A branch line links the harbour with the main railway system. There is a landing ground for aircraft near the town.

TEGAL

Lat. $6^{\circ} 52' S$, Long. $109^{\circ} 08' E$. Population, 43,015 (1930)
Admiralty Chart 3311. Fig. 68.

Tegal is situated on the north coast of Java about forty-five miles east of Cheribon. Anchorage is available in the roadstead in depths of from 3 to 4 fm. Two breakwaters extending out to sea for about 1,200 ft. enclose a small harbour where depths of from 7 to 8 ft. are maintained by dredging.

The harbour can only be used by shallow-draught vessels. Large vessels anchor in the roadstead and discharge their cargo into native boats and lighters. The harbour is provided with several cranes and with three patent slips. In 1938 the foreign trade of Tegal amounted to 193,270 tons; exports, principally sugar, accounted for over 90% of the total tonnage. Tegal is the third port of Java as an exporter of sugar, 170,452 tons being shipped overseas from here in 1938. Sugar factories in and near the town prepare the cane for export.

The railway from Semarang to Cheribon passes through Tegal. East of the town is a landing ground for aircraft.

PEKALONGAN

Lat. $6^{\circ} 52' S$, Long. $109^{\circ} 41' E$. Population, 65,982 (1930)
Admiralty Chart 1653b. Fig. 69.

Pekalongan, at the mouth of the river of the same name, is a small port eighty-four miles west of Semarang. The roadstead affords anchorage in depths of from 3 to 4 fm. about two miles offshore. The approach to the harbour at the mouth of the river is frequently difficult in both monsoons; the river flows into the sea between two concrete dams. A minimum depth of 6 to 8 ft. is maintained in the harbour by constant dredging. At the town of Pekalongan about two miles up the river is a quay with a travelling crane. Small repairs can be carried out at a patent slip on the west bank of the river, just within the entrance to the harbour.

The foreign trade of the port is chiefly concerned with the export of sugar, 37,174 tons of this commodity being exported in 1938. Rubber is also exported.

The railway from Semarang to Cheribon runs through Pekalongan. The main road along the north coast of Java also passes through the town. A good road on the left bank of the river connects the town with the harbour.

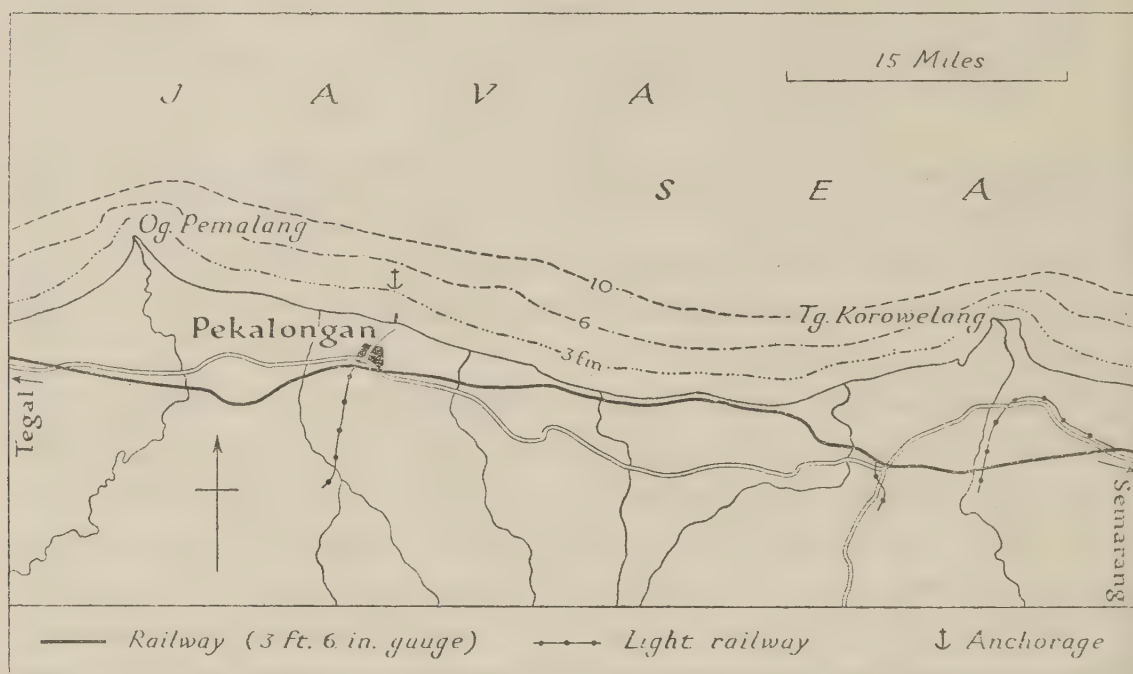


Fig. 69. Pekalongan

Source: Admiralty Chart 1653b.

SEMARANG

Lat. $6^{\circ} 50' S$, Long. $110^{\circ} 24' E$. Population, 217,796 (1930)
Admiralty Chart 932. Figs. 70, 71. Plates 69-70.

Semarang is the chief port and largest town on the northern coastal plain of Java between Batavia and Soerabaja. Unlike these two ports it has no deep-water artificial harbour, the present harbour being available only for small vessels. Ocean-going vessels usually anchor in depths of from 5 to 6 fm. about three miles offshore. The roadstead affords fairly good holding ground, but it is wholly unprotected from winds. The discharging and loading of goods is done by lighters from vessels moored in the roadstead.

Detailed Description

The entrance to Semarang harbour, at the mouth of the Kali Baroe, is formed by two dams or breakwaters, the western one extending 7 cables, the eastern one 5 cables out to sea. In the entrance channel there is a depth of about 10 ft. The artificial harbour runs in a south-easterly direction from the channel between the breakwaters.

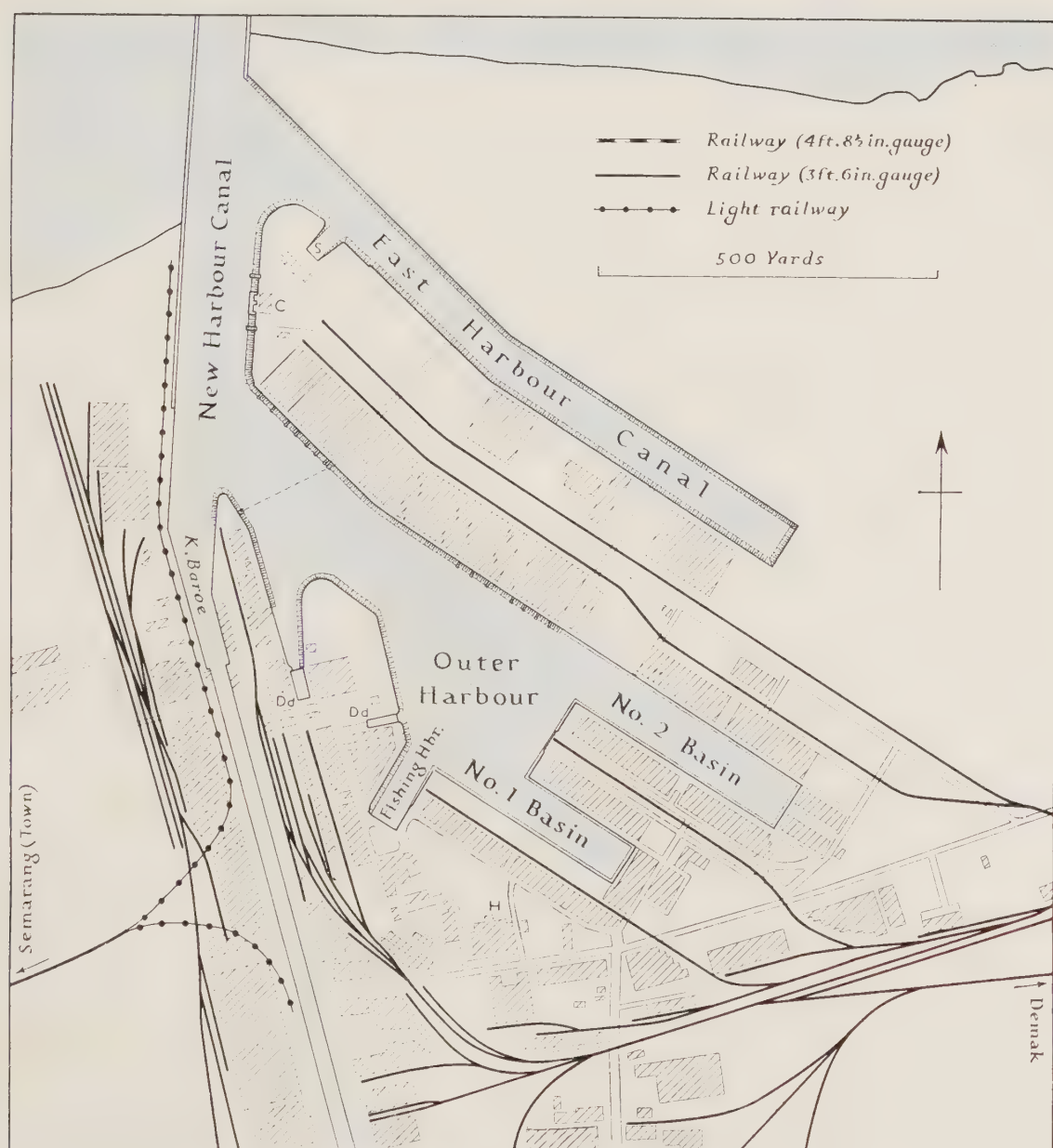
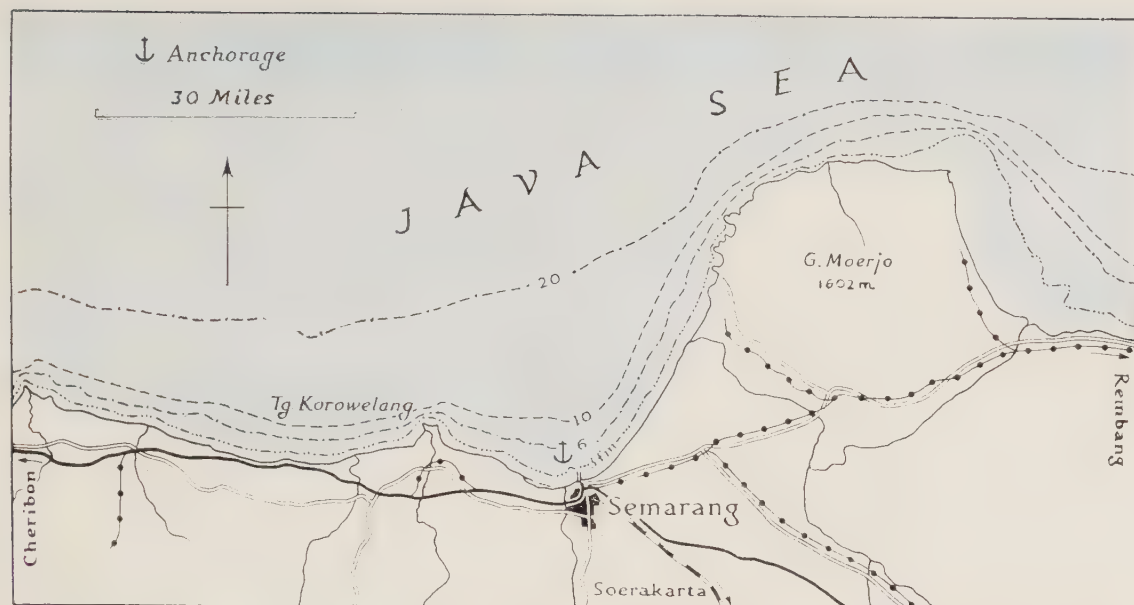


Fig. 70. Semarang; the port and its approaches

C. Customs house; Dd. Dry dock; H. Harbour master's office.

Source: (1) Admiralty Chart 932 (1912, corrected to 1939); (2) Official sources.



Fig. 71. Semarang; the town

1. Theatre; 2. Government offices; 3. Post office; 4. Residence of Regent; 5. Fort Prins van Oranje; 6. Race course; 7. Town hall; 8. Residence of Governor of Midden-Java; 9. Court of Justice.

Source: *Atlas van Tropisch Nederland*, plate 23 (Batavia, 1938).

The berthing length available for lighters is 17,500 ft. Nearest to the sea is the 'East Harbour Canal', but the main section of the port lies on the south-western side of and parallel to this canal. Most of the lighters use what is called the outer harbour and the two parts of the inner harbour (Fig. 70). The depth of water is nearly 12 ft. in the outer harbour and 10 ft. in the inner harbours.

Port Facilities

The port possesses twenty-four electric cranes with lifting capacities of from $1\frac{1}{2}$ to 10 tons, and one steam crane with a lifting capacity of 25 tons. Sixteen of these cranes are owned by shipping companies and the remainder by the harbour board. There is extensive warehouse accommodation.

A large number of lighters, tugs and launches are available. Coal is obtainable only in small quantities, but there are large stocks of fuel oil. The water supplies are good and water is supplied to vessels at anchor in the roadstead. Repairs to small vessels can be carried out in two dry docks, about 130 ft. long and 26 ft. wide.

The Town

The town of Semarang lies a little way inland from the port, above where the Kali Baroe branches from the Kali Semarang. It is the third largest city of Java and the capital of the province of Midden-Java. Like Batavia, it is divided into two parts, the old native town near the coast and the modern town further inland. Most of the Europeans live in the hill suburbs of Tjandi and Djomblang.

Semarang is administered by a municipal council with twenty-seven members, of whom fifteen are Europeans, eight natives and four Foreign Asiatics.

Trade

Semarang is the third port of Java in tonnage of foreign trade. In 1938 its exports amounted to 379,145 tons and its imports to 169,042 tons. Sugar forms about three-quarters of the shipments overseas; other exports are tobacco, tapioca and kapok. Among the chief imports are textiles, for which there is a great demand in the thickly populated districts of Midden-Java.

In 1937, Semarang was visited by 1,762 steam vessels with a total tonnage of 4,891,519 and by 3,471 sailing vessels with a total tonnage of 39,929. The tonnage of steamships calling at the port increased by 50% between 1920 and 1937 while the tonnage of sailing vessels more than doubled in the same period.

Industries

A small shipbuilding yard is situated on the right bank of the Kali Semarang south-west of the port. Wooden lighters, motor boats and tugs of various sizes are built here.

There is a railway repair shop at the port. Among the other industries are two cement and lime works, four sawmills and three printing shops.

Communications

A network of railways serves all the main quays of the harbour. Semarang is the headquarters of the Netherlands Indies Railway Company and of several light railway companies. A standard-gauge railway runs south-east to Soerakarta; light railways connect Semarang with Cheribon on the west and with Rembang on the east.

Semarang is in communication by road with most parts of Java. Good roads link the town with the port. There are two civil aerodromes south of the town and a seaplane anchorage near the harbour.

SOERABAJA

Lat. $7^{\circ} 18' S$, Long. $112^{\circ} 46' E$. Population, 341,675 (1930).

Admiralty chart 934. Figs. 72, 73. Plates 71-76.

Soerabaja is the foremost commercial and naval port in the Netherlands Indies. It lies at the mouth of the Kali Mas, an outlet of the Kali Brantas, on the east coast of Java bordering Madoera strait. The whole of eastern Java is tributary to the port. Ships from all parts of the world call at its quays and wharves. Soerabaja ranks next to Batavia in size among the towns of Java, and is one of the leading manufacturing centres in the island.

Approach and Access

The roadstead at Soerabaja is approached by two channels, the one from the west and north (Westervaarwater), the other from the east (Oostervaarwater). The funnel-shaped entrance to the western channel lies between Og. Pangka in Java and Tg. Modoeng in Madoera; it is occupied by an extensive shoal flat through the centre of which is the main navigable channel, running close to the west of a training wall constructed between Tg. Piring and Djamoeng reef. The width of the fairway through the bar is about 150 yards and there is a depth of water of about 26 ft. at M.L.W.S. and 34 ft. at M.H.W.S. From Tg. Piring southwards to the roadstead depths of 6-12 fm. are found. In the roadstead off the port safe and secure

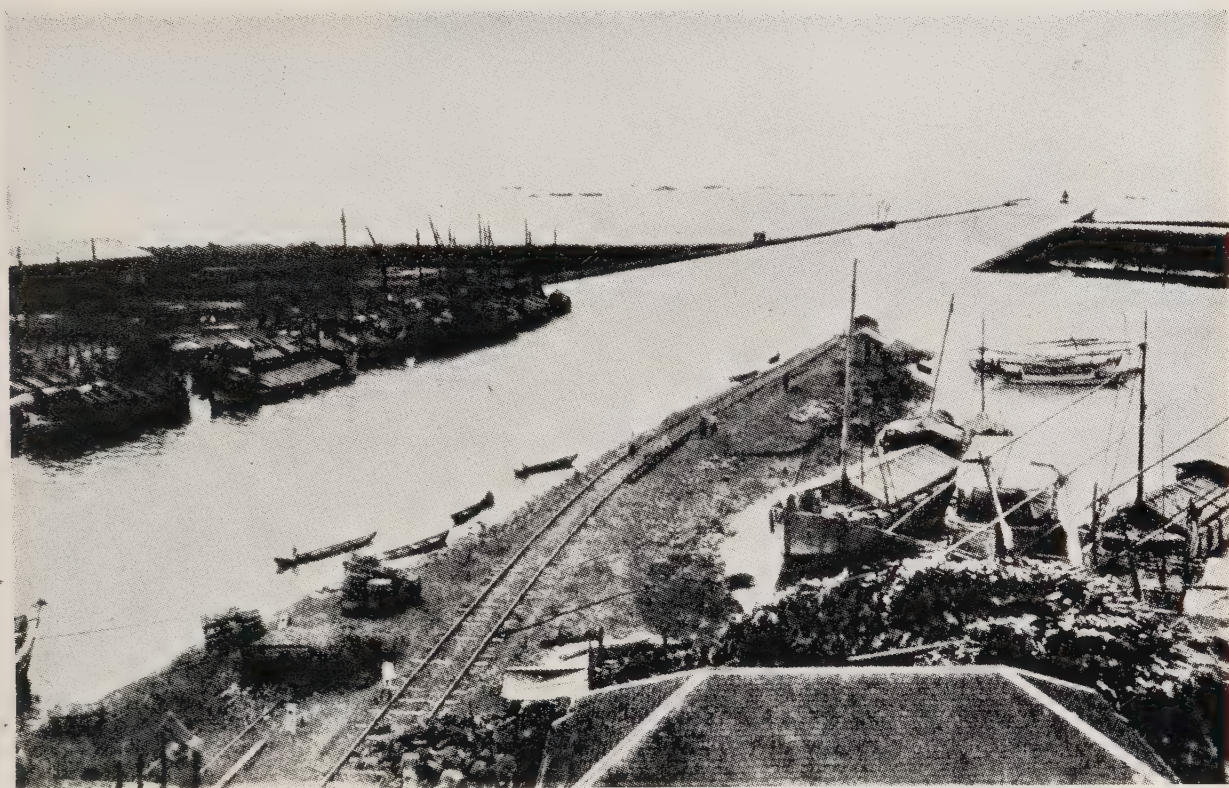


Plate 69. Semarang: mouth of the Kali Baroe

The entrance to the main harbour is on the right. Traffic at the port is carried on by lighters. Larger vessels moor in the roadstead, some of which can be seen in the distance.



Plate 70. Semarang: aerial view of town

View looking south-east. On left is European commercial quarter; the prominent building in right centre is the headquarters of the provincial government.



Plate 71. Soerabaja (Tandjoengperak): general view of harbour, looking north-west



Plate 72. Soerabaja (Tandjoengperak): mouth of the Kali Mas

The cranes are on the Rotterdam Quay alongside which is berthed a vessel of the Blue Funnel line. The building with tower and flagstaff is the harbour office.

anchorage is available at all times of the year in 6 to 10 fm. of water.

The eastern approach to the roadstead, by way of the Oostervaarwater, has two navigable channels separated by a bank of hard sand known as De Tong (The Tongue). The more easterly of these channels is the one most generally used; the other, called Jansen's Channel, runs close to the coast of Java and can only be used by vessels with local knowledge. The depth of water is shallower than in the Westervaarwater, the depth on its bar being reported as between 12 and 23 ft. according to the tide.

The tides at Soerabaja are predominantly semi-diurnal in character. On the western bar the tides rise from 1 to 7 ft. and on the eastern bar from 6 to 10 ft. At spring tides the current in the roadstead is about $2\frac{1}{2}$ knots and at neap tides about 1 knot.

Owing to the shelter afforded by the island of Madoera, shipping is little affected by the weather, either in the roadstead or in the harbour. The largest vessels normally calling at the port have a draught of from 27 to 33 ft. There is accommodation at the quays for twenty-five to thirty large vessels.

Detailed Description

The *commercial port* at Soerabaja lies to the west of the mouth of the Kali Mas and of the naval station to the east of the river. The extensive harbour works of the commercial port are known as Tandjoengperak. They comprise a square basin with a water area of 225 acres enclosed by broad moles on its northern and western sides, with the entrance between them about 300 yards across. On the northern side of the northern mole is the Rotterdam Quay, on the western side the Ymiuden Quay and on the southern side the Amsterdam Quay. The Rotterdam Quay fronting the roadstead has a depth of 32 ft. alongside, while off the other quays is a depth of 25 ft. Most of the shipping companies that maintain a regular service with the port, such as the *Nederland Stoomvaart Mij.*, *Koninklijke Paketvaart Mij.*, *Rotterdamsche-Lloyd* and the *Nederlandsche Oceaan Stoomvaart Mij.*, tie up against the quays of the northern mole. The harbour offices are found on this mole (Plates 71-73).

The eastern side of the harbour is formed by the Tandjoengperak Quay, which is adapted for ships with a maximum draught of about 26 ft. A broad jetty, with the Dock Quay on its northern side, extends from Tandjoengperak Quay.

The Westhavendam, which encloses the harbour basin on the west, is built out from the land at an angle of 70 degrees. Fronting

the harbour is the Genoa Quay with a depth alongside of 35 ft.; it serves a number of industrial companies which own warehouses on this quay. At the seaward end of the Westhavendam is a petroleum quay.

On the southern side of the harbour and parallel with the Genoa Quay is the Holland Pier alongside which is a depth of water of 35 to 40 ft. Vessels of the K.P.M. and *Java-China-Japan Lijn* use this pier.

The Kali Mas is navigable to boats of shallow draught and small native craft. Quays have been constructed near where it enters Madoera strait. The minimum depth of water in the river is about 10 ft.

Between the mouths of the Kali Mas and Kali Semampir is the *naval port*, which consists of two basins separated by a mole. The entrance to the basins from the roadstead is about 600 ft. wide. The depth of water in the basins is maintained at 33 ft.

Port Facilities

The *commercial port* is equipped with twenty-nine cranes with lifting capacities of from $1\frac{1}{2}$ to 10 tons, and one diesel-electric floating crane of 75 tons capacity. Ten of these cranes are on the Rotterdam Quay. On the Genoa Quay, there are four coal transporters each capable of handling 100 tons of coal per hour.

Large warehouses, some owned by private shipping companies, and others by the harbour board, are built on the quays. On the northern mole alone they cover an area of at least 85,000 sq. ft. They are strongly constructed, many being made of ferro-concrete; all, except two, are single-storied buildings. Older warehouses, used for the storage of sugar, are found on the banks of the Kali Mas.

Several powerful tugs and lighters serve as harbour craft. There is a fire-float for use in the harbour or roadstead.

Fuel oil, coal and water are available in large quantities. Vessels can take in fuel oil either from alongside the quays or in the roadstead. The Genoa Quay is the one used for coaling purposes; Australian, Japanese and South African bunker coals are normally stocked. Water is laid on at all the quays and can be supplied by lighters to vessels in the roadstead. The water pipe-lines form an extension of the system serving the town of Soerabaja, where water is obtained partly from the Kali Brantas and partly from the mountains of eastern Java.

The harbour of Tandjoengperak is well provided with facilities for the repair of ships. There are three floating docks owned by the

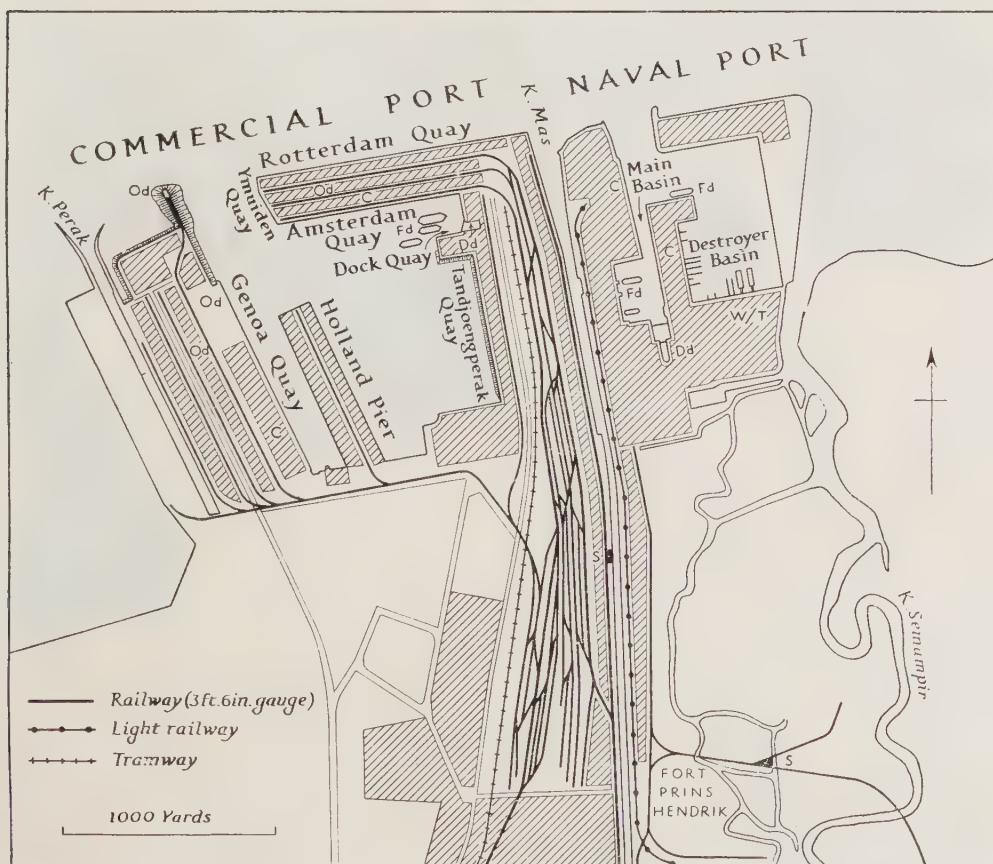


Fig. 72. Soerabaja; the port and its approaches

C. Coal store; Fd. Floating dock; Od. Oil depot; S. Railway station.

Source: (1) Admiralty Chart 934 (1923, corrected to 1939); (2) Official sources.



Fig. 73. Soerabaja: the town

The oil installations of the B.P.M. lie near the railway station at the south side of the Wonokromo Canal.

Source: *Atlas van Tropisch Nederland*, plate 23 (Batavia, 1938).

Soerabaja Droogdok Mij. and one dry dock owned by the government. The floating docks have the following dimensions:

	Length (ft.)	Breadth (ft.)	Depth on sill (ft.)	Lifting capacity (tons)
No. 1 Floating Dock	350	58	19.6	3,500
No. 2 Floating Dock	552	82	24.7	15,000
No. 3 Floating Dock	310	52	17	1,400

Source: Lloyd's List, p. 77.

The second of the two floating docks is made in three sections (self-docking). The docks lie between the Dock Quay and the Amsterdam Quay in the north of the harbour (Plate 74).

The *naval port* has three electric cranes, one of 60 tons, another of 15 tons and a third of 10 tons, and two floating cranes of 25 to 50 tons lifting capacity. As in the commercial harbour, coal, fuel oil and water can be taken on from the quays. Ship repairs can be executed at three floating docks, three dry docks, and a number of slipways. Two out of the three dry docks are for submarines only. The dimensions of the floating docks are as follows:

	Length (ft.)	Breadth (ft.)	Depth on sill (ft.)	Lifting capacity (tons)
No. 1 Floating Dock	325	55	19.5	3,000
No. 2 Floating Dock	276	59	20.5	1,400
No. 3 Floating Dock	341	53	18	2,500

Based on official sources.

The Town

The town of Soerabaja extends in an elongated shape on either side of the Kali Mas some two miles south of the commercial port and naval base. It covers an area of nearly twenty-five sq. miles; the length from north to south is nine miles and the greatest breadth is five miles. The business quarters and government offices are found in the older part of the town, nearest the sea; the streets here are narrow and awkward, causing frequent traffic congestion. The residential quarter for Europeans lies further to the south (Plates 75, 76).

Soerabaja is the capital of the province of Oost-Java. The town is administered by a municipal council, under a burgomaster assisted by three aldermen. There are twenty-seven members of the council of whom fifteen are Europeans, eight natives, and four Chinese.

History

Before 1911, when work was begun on the construction of the

present harbour of Tandjoengperak, all large vessels had to anchor in the roadstead, where cargoes were discharged into lighters and conveyed thence to the warehouses along the banks of the Kali Mas. Between 1911 and 1920 the 1,300 ft. wide dam on the west side of the Kali Mas, and the two main moles were constructed. The three floating docks were also added to the port facilities during this period. In the following decade the Holland Pier was built and the number of warehouses further increased. By the end of 1932 a sum of 78 million guilders had been expended on the harbour. Since the completion of the extensive harbour works, Soerabaja has become one of the leading commercial ports in the Netherlands Indies.

Trade

In 1938 the foreign trade of Soerabaja amounted to 1,145,590 tons, exports comprising 796,226 tons and imports 349,364 tons. The tonnage of goods handled exceeds that of any other port in Java, but is less than that of the ports of Palembang and Balikpapan in the Outer Provinces (see pp. 378, 390). In the value of its trade, however, it is surpassed by Batavia (Tandjoengpriok).

Soerabaja is the principal port for eastern Java, and most of its exports comprise goods obtained from this part of the island. Plantation products, such as sugar, oilseeds, coffee and rubber, form a large part of the shipments overseas; cassava is also an important export. The largest single item is sugar, 474,269 tons being exported in 1938, or more than one-third of the total export of sugar from Java. Of the non-agricultural exports, the most important is petroleum and petroleum products, 91,303 tons being shipped abroad in 1938.

Among the list of imports, heavy minerals, such as coal for bunkering and other purposes, take a primary place. In 1938 they amounted to 70,909 tons, or over one-fifth of the total imports. A great variety of manufactured articles is also imported. The following table shows the shipping traffic entered and cleared at Soerabaja between 1920 and 1937:

	Steamships		Sailing Vessels	
	No.	Tons	No.	Tons
1920	1,548	2,879,445	6,309	61,130
1925	1,955	4,637,102	4,253	39,575
1934	1,789	4,780,918	11,171	100,353
1935	1,827	4,809,893	15,724	167,137
1936	1,731	4,785,865	15,592	148,056
1937	1,922	5,135,689	17,843	174,558

Source: *Indisch Verslag*, 1938, vol. II, p. 367 (Batavia, 1938).

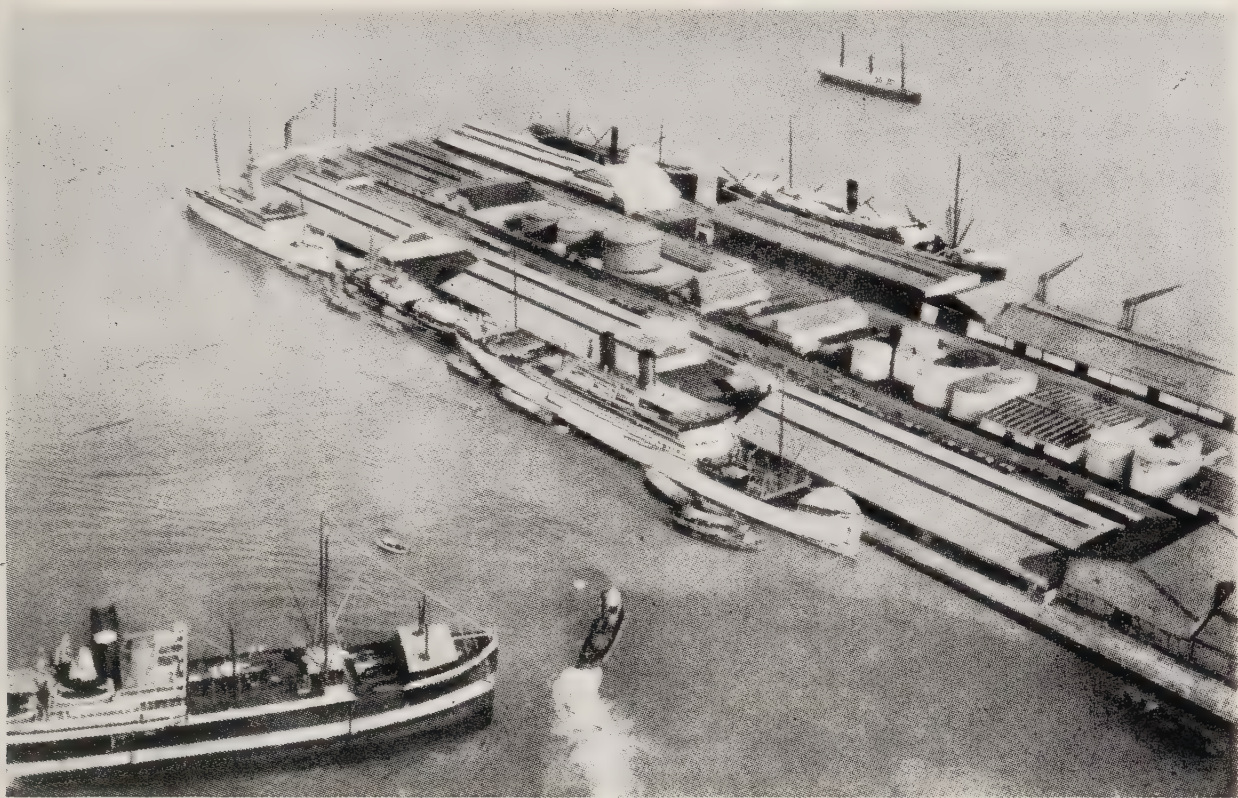


Plate 73. Soerabaja (Tandjoengperak): Rotterdam and Amsterdam quays

View looking west-north-west. The Rotterdam Quay is in the background and the Amsterdam Quay in the foreground of the photograph. Oil tanks are seen between the lines of warehouses.



Plate 74. Soerabaja (Tandjoengperak): Floating dock



Plate 75. Soerabaja: aerial view of town

The photograph shows the main business centre of Soerabaja, about three miles south of the port. The Kali Mas is flowing from the left to the right of the picture.



Plate 76. Soerabaja: aerial view of Wonokromo suburb

Wonokromo, which lies in the extreme south of Soerabaja, has only recently been developed as a residential area. In the foreground is the Wonokromo Canal crossed by the State Railway line to Sidoardjo. At the confluence of the canal with the Kali Mas are sluice gates to control the flow of water in the river.

The number and tonnage of both steamships and sailing vessels increased during these years. A greater number of sailing vessels visits Soerabaja than any other port in the East Indies.

Industries

Soerabaja is one of the chief manufacturing centres in Java. Many of the industries are concerned with the processing of agricultural products. Thus, there are a number of sugar refineries as well as factories where rubber and kapok are prepared for export. These factories are mainly to be found in the south-eastern parts of the town along or near the banks of the Kali Mas.

The refining of petroleum is one of the most important single industries in Soerabaja. The crude oil, obtained from fields a little to the south of the town, is refined at the works of the *Bataafsche Petroleum Mij.* (B.P.M.), situated alongside the Wonokromo canal (Fig. 54). Other industries include several engineering workshops and railway repair shops.

Communications

The quays and wharves at Tandjoengperak are well served by rail and road connections. The railways, which are of 3 ft. 6 in. gauge throughout, all connect with Soerabaja and from here there are lines to other parts of Java. A double line of electric tramways maintains a good service between the commercial port and the town; tramways also run between the residential and business quarters. The main roads in both the port and town are largely of asphalt.

A little to the south-west of Tandjoengperak is a naval seaplane station and a civil aerodrome. Both are used by the K.N.I.L.M.

PASOEROEAN

Lat. $7^{\circ} 38' \text{ S}$, Long. $112^{\circ} 55' \text{ E}$. Population, 36,973 (1930).

Admiralty Chart 3672. Fig. 74.

Pasoeroean is a small port at the mouth of the Kali Gembong, which flows into Madoera strait forty miles south-south-east of Soerabaja. The roadstead provides anchorage in a depth of 5 fm. about two miles offshore. Cargo is loaded and discharged by lighters which can enter the Kali Gembong at high water. At the mouth of the river is a prau harbour.

The export of agricultural products is the main feature of the foreign trade of Pasoeroean. Sugar and tapioca are the principal exports. Imports are insignificant.

Pasoeroean is the capital of the residency of the same name. It is connected by road and rail with Soerabaja and other towns in eastern Java.

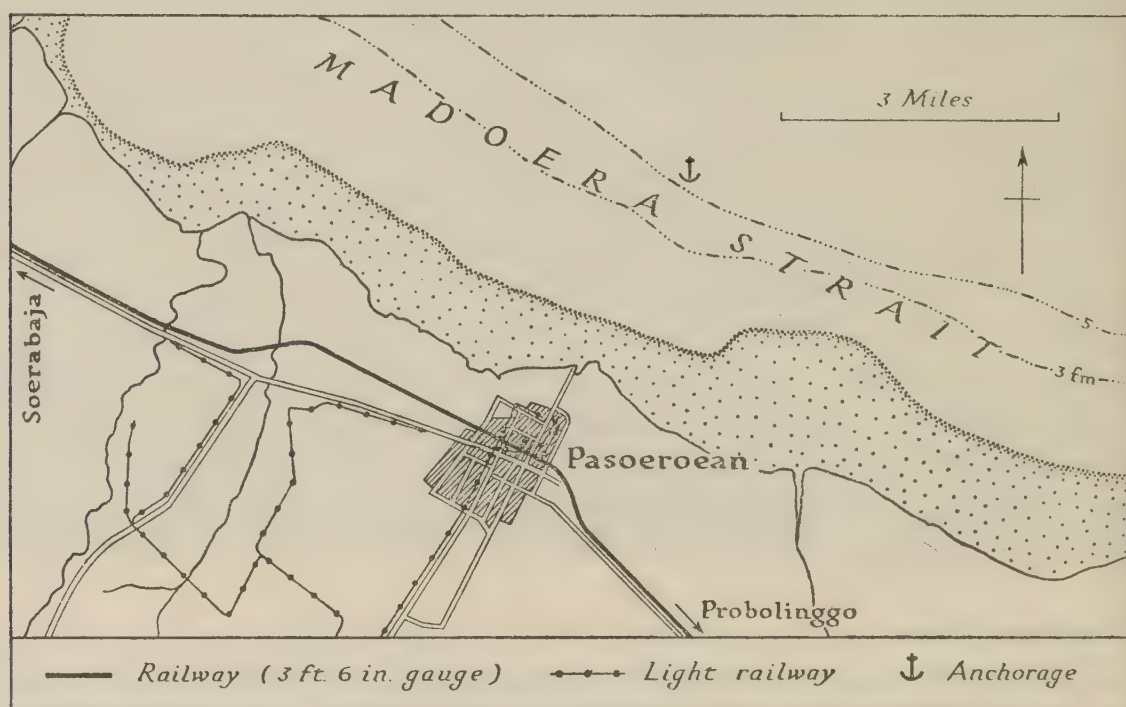


Fig. 74. Pasoeroean

Source: Admiralty Chart 3672 (1908, corrected to 1939).

PROBOLINGGO

Lat. $7^{\circ} 45' S$, Long. $113^{\circ} 13' E$. Population, 37,009 (1930).

Admiralty Chart 3311. Fig. 75.

Probolinggo is situated about sixty miles by road from Soerabaja on the coast of Java facing Madoera strait. The approach to the port is marked by the island of Ketapang, south of which there is good, partly sheltered anchorage in a depth of $6\frac{1}{2}$ fm. A canal between two stone moles links the roadstead with the harbour, which consists of a rectangular basin with quays and wharves. Praus and lighters only can use the port.

Exports predominate in the foreign trade of Probolinggo. Two-thirds of the exports are sugar, over 70,000 tons of this product being exported in 1938.

The town of Probolinggo is well built with a rectangular street pattern. There is communication by railway and road with the chief centres of population in eastern Java. A branch railway connects the town with the harbour basin.

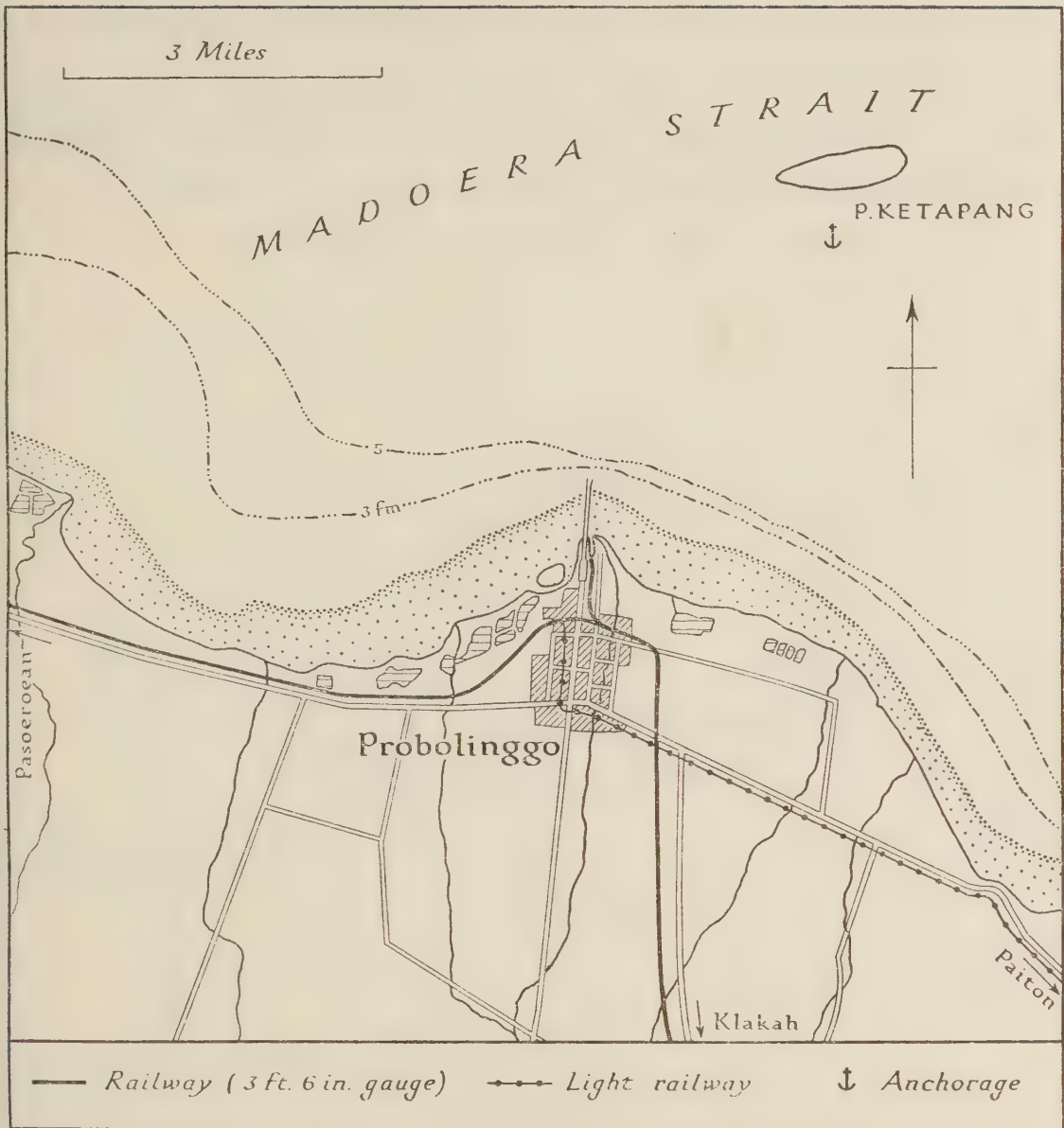


Fig. 75. Probolinggo

Source: Admiralty Chart 3311 (1902, corrected to 1939).

PANAROEKAN

Lat. $7^{\circ} 42' S$, Long. $113^{\circ} 56' E$. Population: no information.

Admiralty Charts 1653c, 3672. Fig. 76.

Panaroekan, the port for Sitoebendo, is one of the chief ports in Java east of Soerabaja. It lies near the mouth of the Kali Sampoean at the head of a small bight on Madoera strait between Tg. Pecharan and Tg. Paras. In the roadstead vessels can anchor in depths of 9 fm. The loading and unloading of cargo is carried on by lighters from vessels moored in the roadstead. Cargo is loaded into and discharged from the lighters at two piers which extend a short distance from the shore.

The approach to the piers is frequently difficult during the period of the west monsoon.

The foreign trade of Panaroekan in 1938 totalled 144,463 tons. Almost the whole of this tonnage was made up of export goods, mainly agricultural products, such as tobacco and sugar.

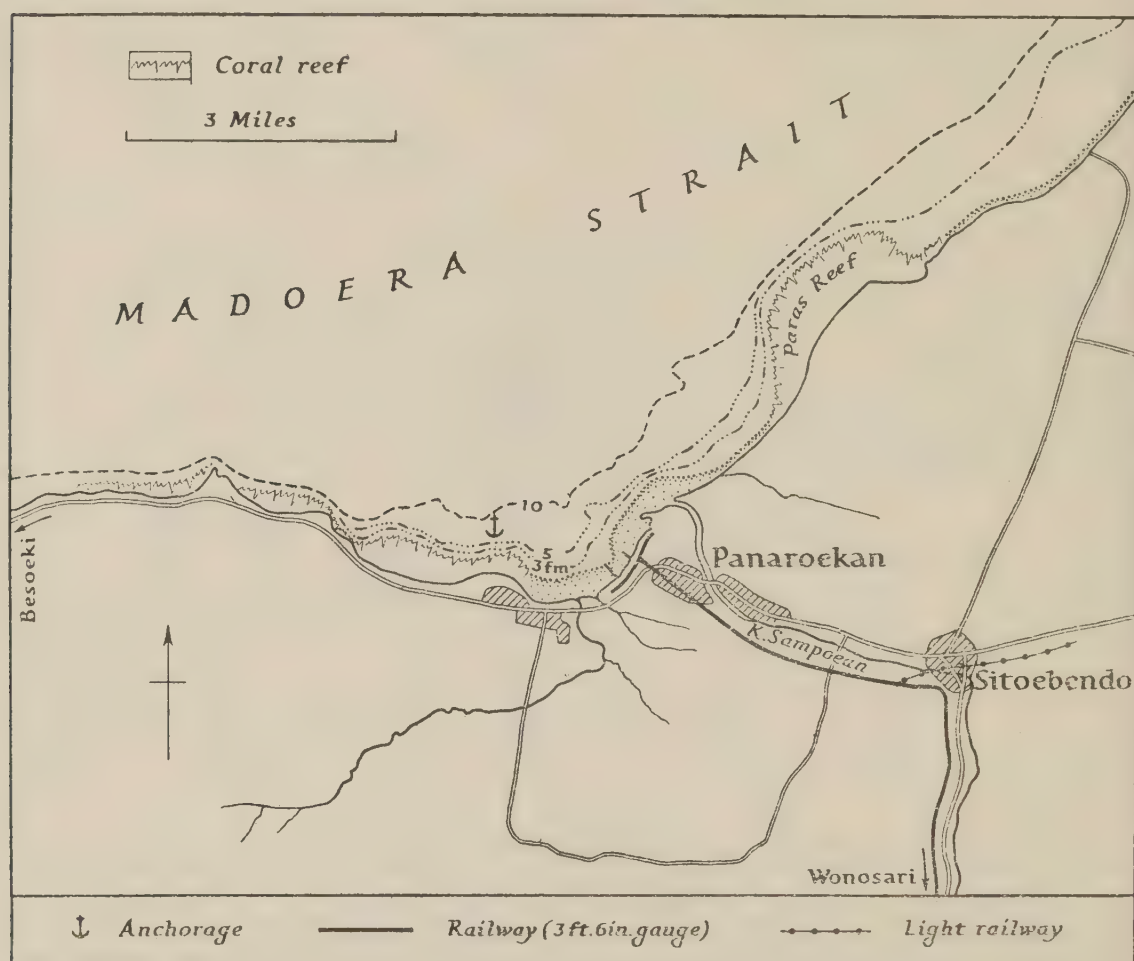


Fig. 76. Panaroekan

Source: Admiralty Chart 3672 (1908, corrected to 1938).

Panaroekan is in communication by rail and road with Sitoebendo. A road runs along the coast westwards to Soerabaja. The port is the starting point of a ferry service to Kalianget on the island of Madoera.

KALIANGET

Lat. $7^{\circ} 3' S$, Long. $113^{\circ} 57' E$. Population: no information.

Admiralty Chart 1653c. Fig. 77.

Kalianget is the port for the town of Soemenep in Madoera. It stands on Soemenep bay near the eastern end of the island and is accessible to ships with a draught of 10 ft. During the west monsoon there is secure anchorage off Oedjoeng Tandjoeng at the entrance to the bay

in a depth of 4 fm.; in the period of the east monsoon the usual place of anchorage lies further south in the lee of Gili Genteng in a depth of 6 to 7 fm. The customs and harbour offices of the port are situated near the mouth of the Kali Marengan, a river flowing into the head of

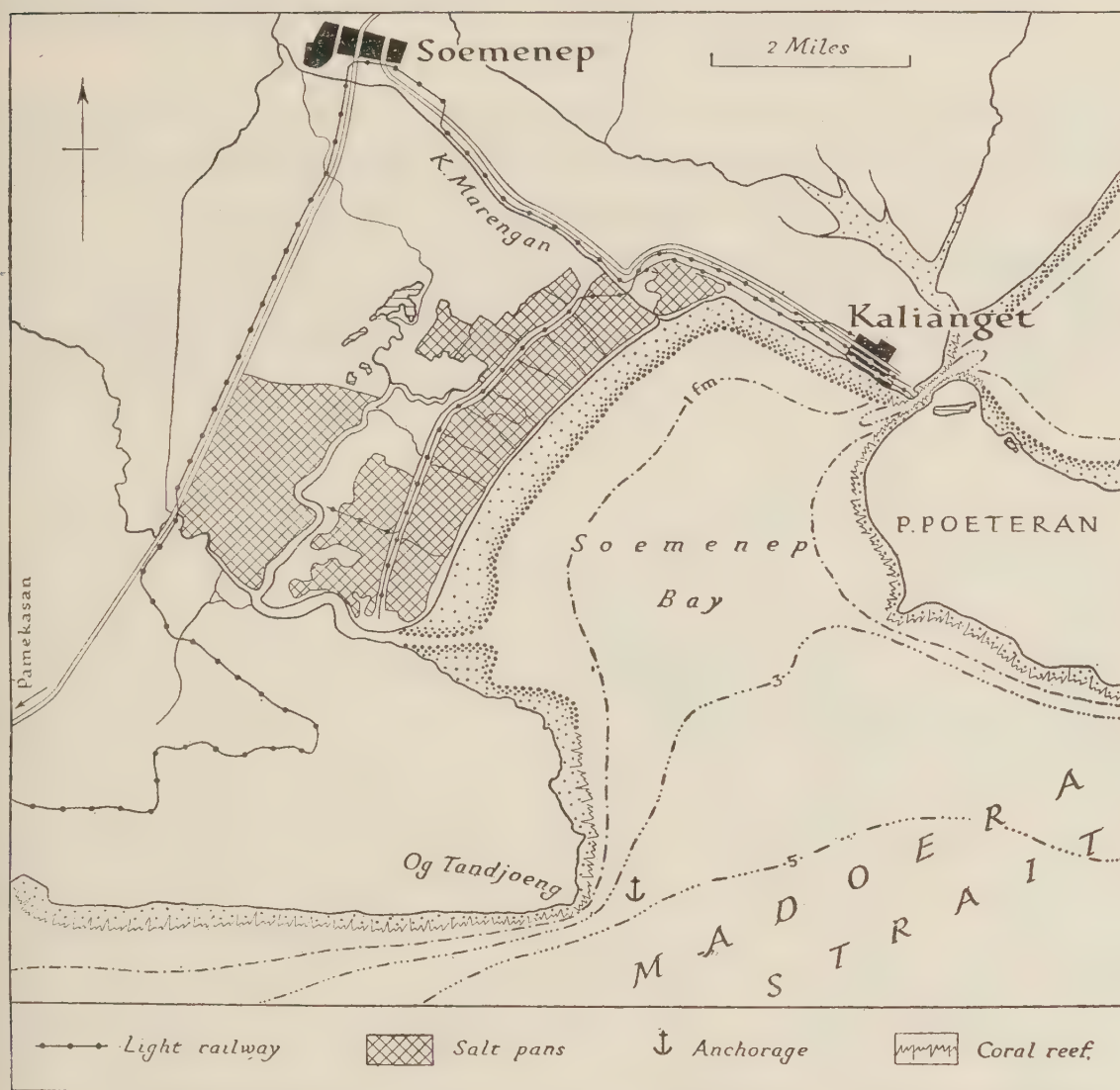


Fig. 77. Kalianget

Source: (1) Admiralty Chart 1653C. (1934, corrected to 1940); (2) Java and Madura 1 : 50,000 (G.S.G.S. 4202).

Soemenep bay. In the narrow strait between Kalianget and Poeteran island, which bounds the bay on the east, is a pontoon pier; about half-way between the narrows and the Kali Marengan is another pier with a depth of 8 ft. at its head.

Extensive salt-pans are found in the vicinity of Kalianget and salt is the principal article of trade. There is a factory which prepares the salt for export.

Kalianget is connected by steam-tram and by road with Soemenep.

A steamboat service runs between the port and Panaroekan on the north coast of Java.

BANJOEWANGI

Lat. $8^{\circ} 13' S$, Long. $114^{\circ} 23' E$. Population, 25,185 (1930).

Admiralty Chart 3726. Fig. 78.

Banjoewangi, the easternmost of the ports of Java, is situated at the mouth of a river about six miles south of the narrows in Bali strait. Large vessels can find good anchorage in the outer roadstead in depths varying from 4 to 7 fm. and there is only room for a limited number of vessels. On the inner side of the long curved sandspit, which runs parallel with the shore for a considerable distance, is a prau harbour

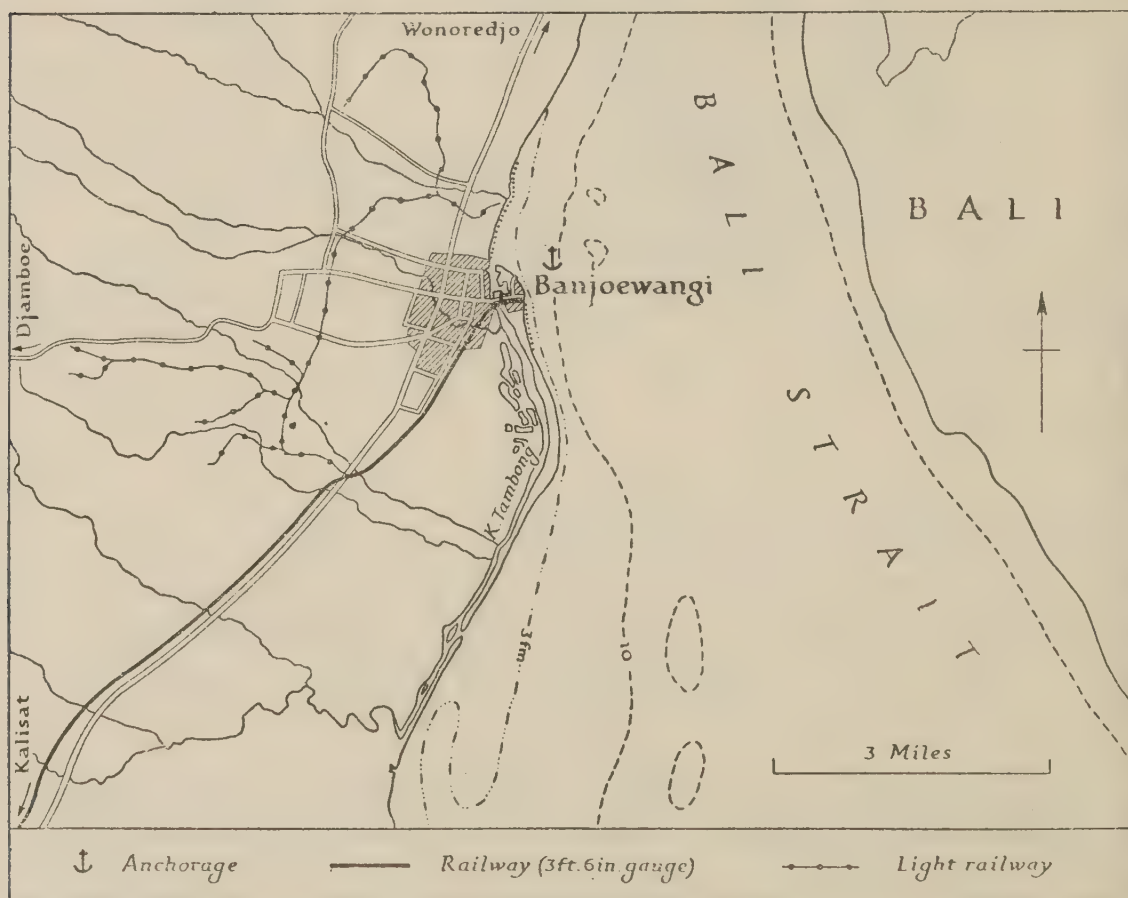


Fig. 78. Banjoewangi

Source: (1) Admiralty Chart 3726 (1909, corrected to 1938); (2) Java and Madura 1 : 50,000 (G.S.G.S. 4202).

with wharves for the loading and unloading of cargo. It can only be entered at or near high water. Fresh water is laid on at the wharves. A small pier, used by boats and praus, extends from the seaward side of the harbour.

Almost the whole foreign trade of Banjoewangi consists of the export of agricultural products. The trade of the port has increased recently with the extension of plantations in its hinterland.

Banjoewangi is the eastern terminus of the railway which runs the length of the island. It is also connected by good roads with the rest of Java.

TJILATJAP

Lat. $7^{\circ} 44'$ S, Long. 109° E. Population, 28,309 (1930).

Admiralty Chart 932. Fig. 79.

Tjilatjap lies at the mouth of the Kali Donan opposite the eastern end of the island known as Noesa Kambangan, in the extreme west of the province of Midden-Java. It is the only port of importance on the south coast of Java.

Approach and Access

The entrance channel to the port runs close to Oedjoeng Karang-bolong, the north-east point of Noesa Kambangan, off which there is a narrow steep-to reef; on the northern side of the channel is an extensive, partly drying bank of hard sand. Tjilatjap inlet, the stretch of water between the mainland and Noesa Kambangan, affords secure anchorage at all times of the year in depths of from $4\frac{1}{2}$ to 6 fm. As the inlet is not lighted it can only be used in daytime. Semi-diurnal tides are experienced. The tidal streams vary from a half to one knot at neaps to two or four knots at springs, though in the wet season, owing to the influence of the Kali Donan, the outgoing stream may attain a rate of 5 knots. The port is accessible at high water to ships drawing 28 ft and to those drawing 21 ft. at any state of the tide.

Detailed Description

The main quays of the port are found on the left bank of the Kali Donan where the river enters the Tjilatjap inlet. The more northerly of the two quays used by vessels is 400 ft. long; the other is 1,369 ft. long. They give accommodation for four ships each of 450 ft. The depth alongside each pier is 22 ft. at M.H.W.S.

North of the shorter of the two quays is an oil jetty with a depth of 25 ft. alongside. In the middle of the river and parallel to the quays are four mooring buoys.

Along the northern shores of the Tjilatjap inlet towards the eastern end of the town are two small piers, used by lighters and native boats. In this part of the town a large area has been reclaimed from swamp

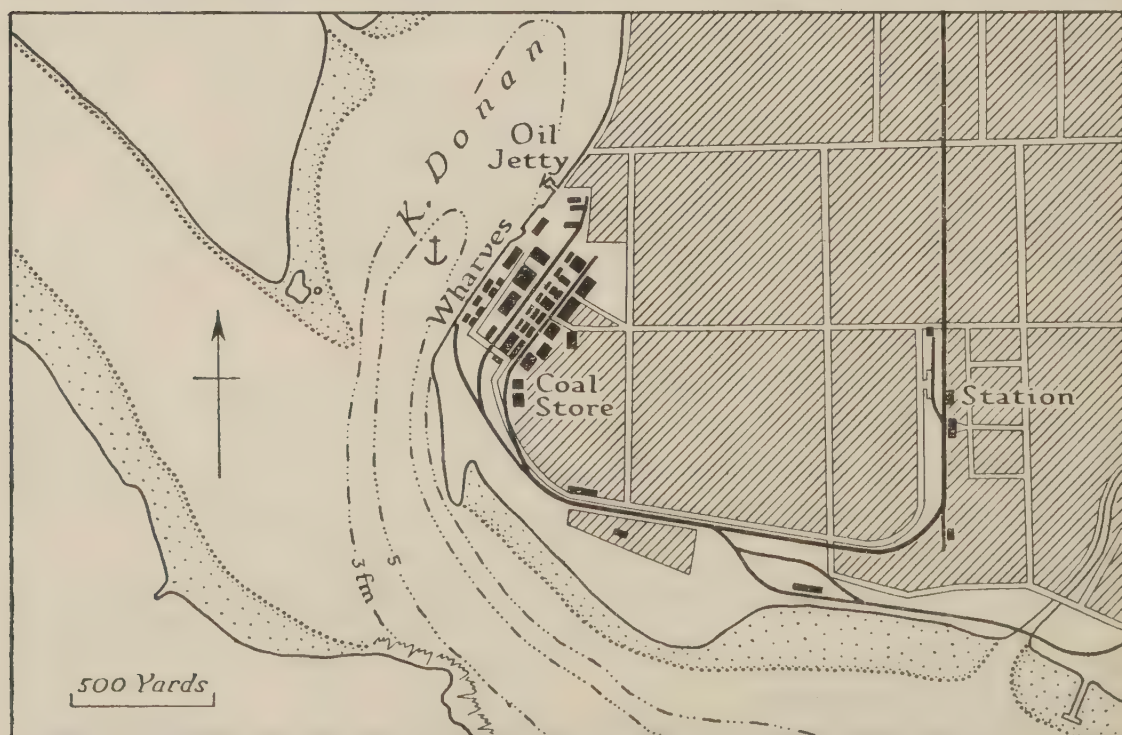


Fig. 79. Tjilatjap

Source: (1) Admiralty Chart 932 (1912, corrected to 1939); (2) Official sources; (3) Java and Madura, 1 : 50,000 (G.S.G.S. 4202).

and about 3,500 ft. of new quayage is projected. It is proposed to provide berths for ocean-going ships by dredging to a depth of 25 ft.

Port Facilities

Behind the quays on the left bank of the Kali Donan are six government warehouses, with a total area of 59,500 sq. ft. and behind these there are thirty-three large private warehouses.

Large stocks of coal and oil are available for fuelling. The B.P.M. has storage tanks for fuel oil and gasoline, with a total capacity of from five to six thousand tons; the N.K.P.M. maintains a stock of lubricating oils. Pipe-lines lead to the oil jetty. Water can be supplied by pipe-line to ships alongside the quays and from lighters to ships moored in the river.

Small repairs can be carried out. There is a patent slip for vessels not exceeding 82 ft. in length. It has a lifting capacity of 190 tons.

The Town

The town of Tjilatjap is attractively laid out with broad tree-lined avenues, forming a rectangular pattern. The situation is unhealthy owing to large swamps in the neighbourhood and this accounts for the small number of Europeans who live in the town. Tjilatjap is the headquarters of an Assistant-Resident.

Trade

In tonnage of foreign trade Tjilatjap is the ninth port of Java. It exported 83,652 tons and imported 8,458 tons of merchandise in 1938. Most of the exported goods were agricultural products, such as sugar and tapioca.

Communications

Tjilatjap is connected with the railway and road system of Java. The railway runs close to the main quays of the commercial port. A canal links the town with the Kali Serajoe about six miles to the north-east.

PORTS OF SUMATRA

The official trade statistics list thirteen ports in Sumatra and in the adjacent islands of Bangka and Billiton. The three leading ports, Palembang, Pangkalanbrandan (Pangkalansoesoe) and Belawan, each have an annual foreign trade of over half-a-million tons. The remaining ports are small, with less than 100,000 tons of foreign trade in 1938.

SABANG

Lat. $5^{\circ} 54'$ N, Long. $95^{\circ} 20'$ E. Population, 6,855 (1930).
Admiralty Chart 3869, 3870. Fig. 80. Plates 77-78.

Sabang lies on the north coast of Poelau We, the largest of a group of islands off Atjeh Hoofd, the northernmost point of Sumatra. The port lies close to the sea route from Colombo to Singapore and serves principally as a bunkering station for ships on this route. All the harbour works, with the exception of the oil installations, belong to the Sabang Bay Harbour and Coal Company, to whom the management of the port is entrusted by the Netherlands Indies government.

Approach and Access

Sabang bay, at the northern end of which the port is built, has a broad entrance clear of dangers, between Oedjoeng Lho Me and Poelau Klah (Kelas). Secure and sheltered anchorage may be obtained in the north of the bay off Sabang in depths of 15 to 20 fm. The east and south of the bay is sheltered by hills and encumbered by reefs and shoals; it also suffers from exposure to the west monsoon. The rise of the tide varies from 3 to 5 ft.; the tidal streams are weak. All classes of vessels can moor in the bay and vessels of 20,000 tons can be accommodated alongside the wharves.

Detailed Description

The wharves and quays of the port extend in an almost continuous line round the northern shores of Sabang bay. Close to the east of Oedjoeng Lho Me is the West Wharf, and then further round the bay are the main coaling wharves divided into two branches or arms. The western arm is 1,190 ft. long, offset 55 ft. from the shore and joined to it by fourteen gangways; the eastern arm is 730 ft. long with eight gangways joining it to the shore. The depth alongside this wharf is 30 ft. at M.L.W.S. A short distance offshore are a number of mooring buoys. East of the coaling wharf is a ferry pier and the shore nearby has been quayed, but only small craft go alongside. The Commercial Wharf, which lies south-east of the ferry pier, is 660 ft. long and 40 ft. wide, with a depth of 30 ft. alongside; it is linked to the shore by six gangways. The harbour master's office and the post office are near this wharf. About 700 yards further south is a petroleum jetty, 450 ft. long and 8 ft. wide, with a depth of 33 ft. at its head. Nearby on the south is a projecting wharf, 480 ft. long on its seaward side and about 300 ft. wide.

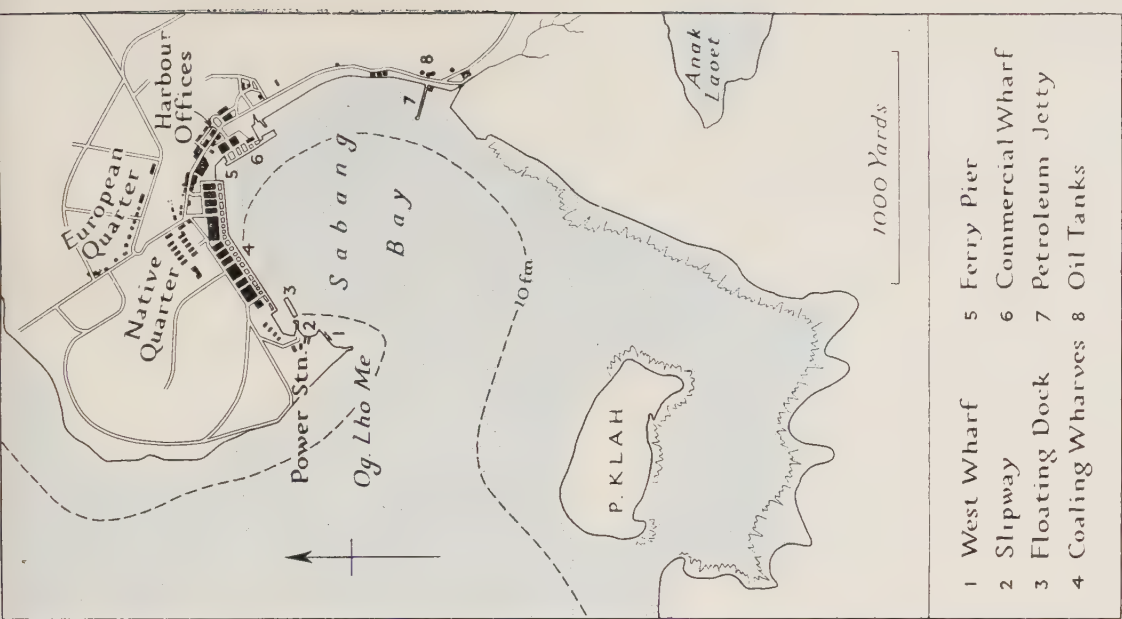
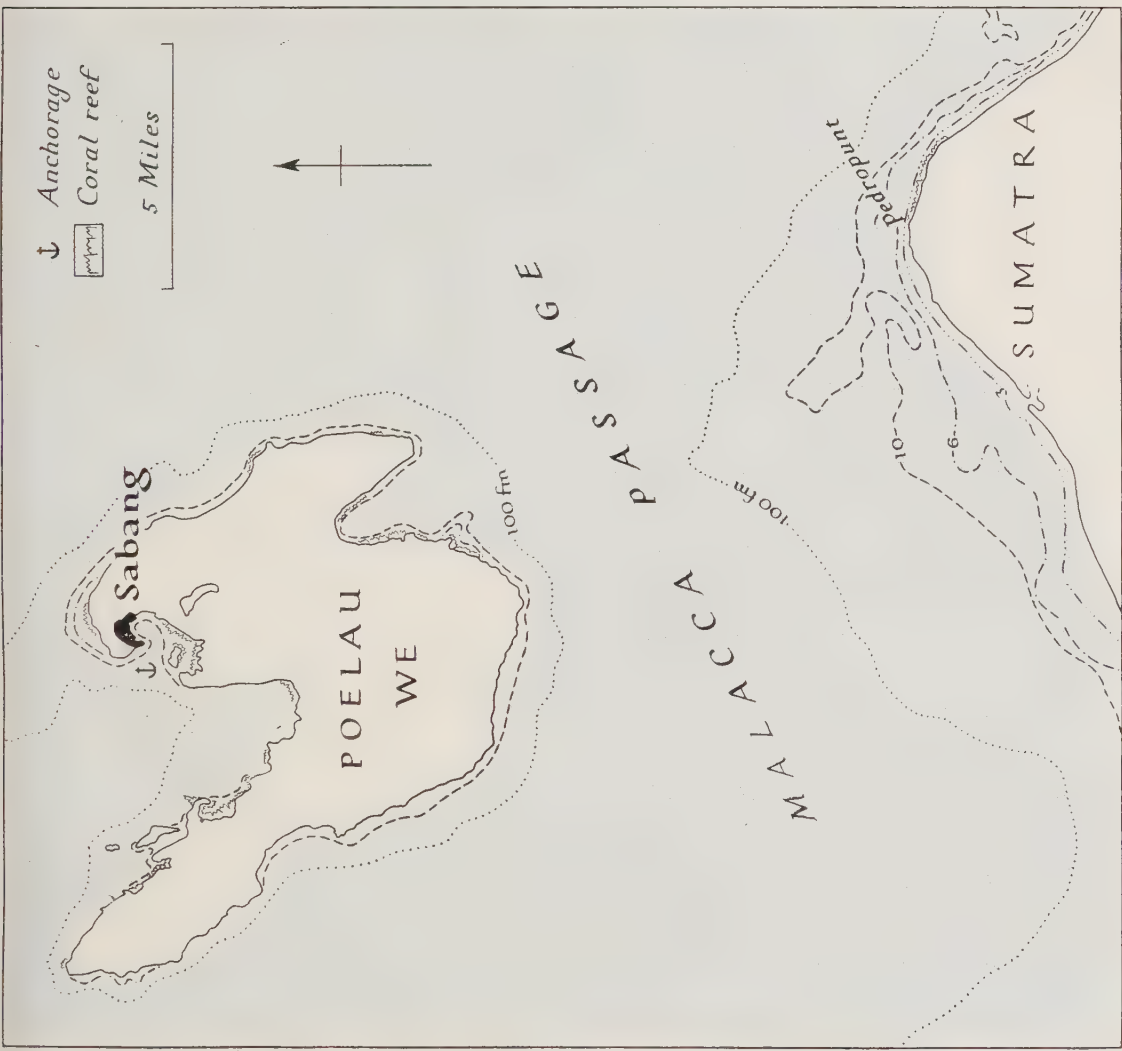


Fig. 80. Sabang

Source: (1) Admiralty Chart 3869 (1930); (2) Official sources.

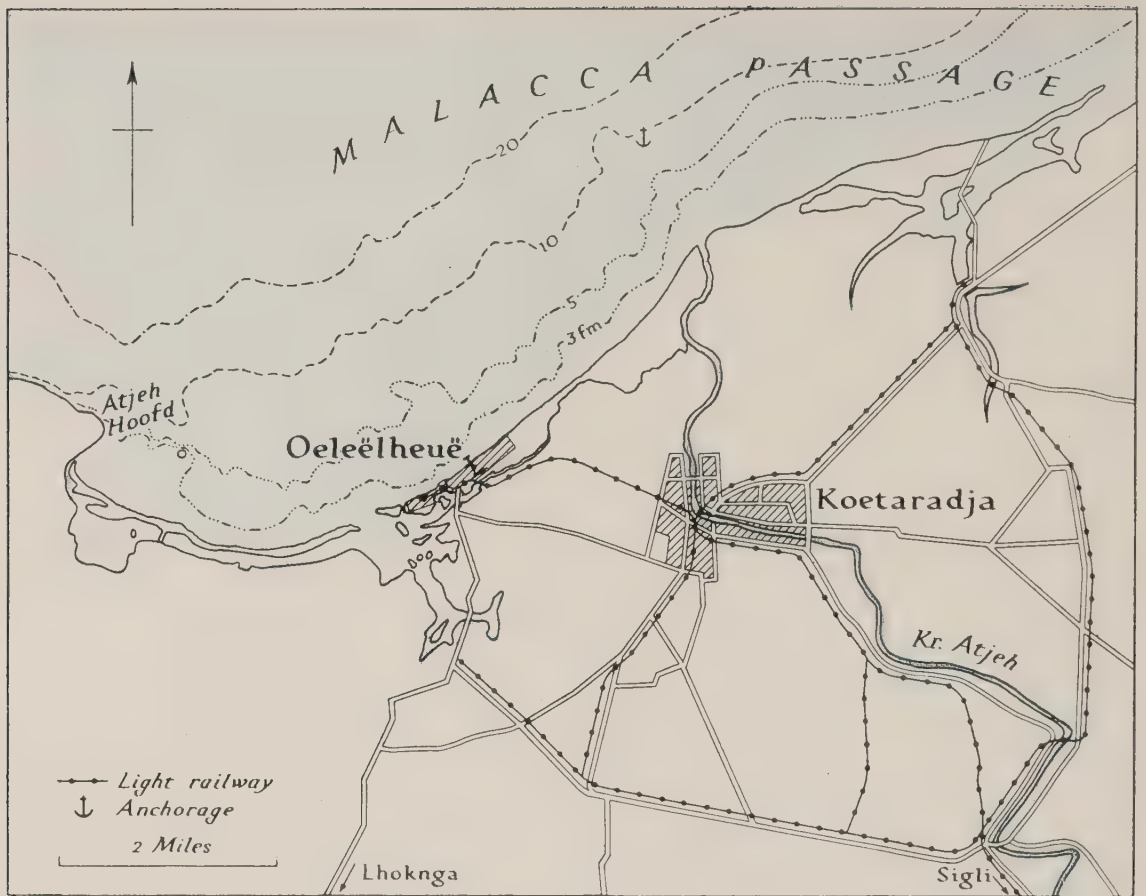


Fig. 81. Oeleëlheuë

This is the most northerly port on the mainland of Sumatra. Since the beginning of this century it has declined in importance with the development of Sabang, on the island of Poelau We, to the north of the Malacca Passage. The light railway connects Oeleëlheuë with Sigli and Medan, the capital of Sumatra.

Source: (1) Admiralty Chart 2777 (1930, corrected to 1938); (2) Official sources; (3) Northern Sumatra 1 : 40,000 (G.S.G.S. 4293).

Port Facilities

The port is equipped with one 30-ton floating crane and one 7½-ton floating steam grab crane. There are also five electric coal transporters on the coaling wharf—four of 2 tons and one of 2½ tons capacity. From 100 to 150 tons of coal can be loaded per hour. The transporters can also be used for general cargo.

The wharves and quays have extensive warehouse accommodation and stacking space. Behind the coaling wharves are seventeen sheds, with concrete floors, for storage of 50,000 tons of coal. The total area covered by warehouses at the port is 70,000 sq. ft.

Coal lighters, a tug and several motor launches are available as harbour craft.

Considerable stocks of coal and oil are kept for bunkering purposes. Three large oil tanks and one diesel tank lie near the petroleum jetty; approximately 8,500 tons of fuel oil are normally stocked. Oil pipelines serve the commercial wharf and the petroleum jetty. Water is provided to ships from a piped supply on the wharves; harbour water-boats are also in use.

The repair of ships is carried out at a floating dock and several patent slipways. The floating dock is 391¼ ft. long and 63 ft. wide with a lifting capacity of 5,000 tons; it can take ships up to a maximum draught of 19 ft. Three of the slipways at the port are for the construction of small craft and lighters. There are a number of engineering workshops engaged in ship-repairing.

The Town

The small town of Sabang is built on the hill slopes behind the wharves. The native and European quarters are clearly distinguished. At the eastern end of the town is a military barracks.

Trade and Communications

As a seaport, Sabang dates from the end of last century. In 1887, the company known as the Atjeh Association, which had for some years been developing the port of Oeleëlheuë, received a grant of land for the establishment of a coaling station on Poelau We, but seven years elapsed before the first delivery of coal at Sabang. The liquidation of the Atjeh Association occurred shortly afterwards and the *N.V. Zeehaven en Kolenstation Sabang* was formed. This company improved the port facilities so that Sabang not only surpassed in importance the neighbouring port of Oeleëlheuë, but became one of the chief bunkering stations in the Netherlands Indies.

In 1938 Sabang was the seventh port of the Netherlands Indies in

tonnage of shipping. Over 2,300,000 tons of shipping entered and cleared the port in this year. Almost all the vessels call at Sabang for fuelling purposes; the amount of cargo loaded and discharged is relatively small.

Sabang is visited regularly by vessels of the K.P.M., and of the principal European steamship companies. A submarine cable connects Sabang with Oeleëlheuë, on the north coast of Sumatra. About four miles from the port is a civil aerodrome; there is a seaplane anchorage in Sabang bay.

OELEËLHEUË

Lat. $5^{\circ} 35' N$, Long. $95^{\circ} 18' E$. Population: no information.
Admiralty Chart 3869. Fig. 81.

Oeleëlheuë, the most northerly mainland port in Sumatra, is the outlet for Koetaradja, the capital of Atjeh Residency. It lies on a sand spit near the mouth of the Kroeëng Atjeh. In the roadstead vessels can anchor in depths of 4 to 5 fm. about a quarter of a mile from the shore. The holding ground is good, but the anchorage suffers from exposure to both monsoons. There is one small pier used by lighters. South-west of the pier is the entrance to a narrow and shallow lagoon which runs eastwards behind the town.

There are a number of steam cranes for handling cargo. Goods discharged at the port can be stored at the government warehouses. There are several tanks for the storage of fuel oil. The Atjeh Tramway Company has a slipway where lighters of up to 150 tons are repaired.

Oeleëlheuë has lost much of its importance since the development of Sabang on Poelau We. It still exports small quantities of agricultural products grown in the coastal regions of northern Sumatra. The port is connected by railway and road with Koetaradja.

PANGKALANBRANDAN (PANGKALANSOESOE)

Lat. $4^{\circ} 1' N$, Long. $98^{\circ} 17' E$. Population: no information.
Admiralty Chart 3574. Fig. 82.

Pangkalanbrandan, on the east coast of Sumatra about fifty miles north-west of Medan, is an important oil-refining centre, refined products being shipped from Pangkalansoesoe, eight miles north of the town. At Pangkalanbrandan, which lies on the right bank of the shallow Soengai Babalan about four miles above its mouth, there is a wharf, 300 ft. in length and offset 65 ft. from the shore to which it is



Plate 77. Sabang: aerial view

Sabang bay is well sheltered by forested hills. The coaling wharves are seen at the extreme right. The European quarter occupies the cleared area in the centre of the photograph.

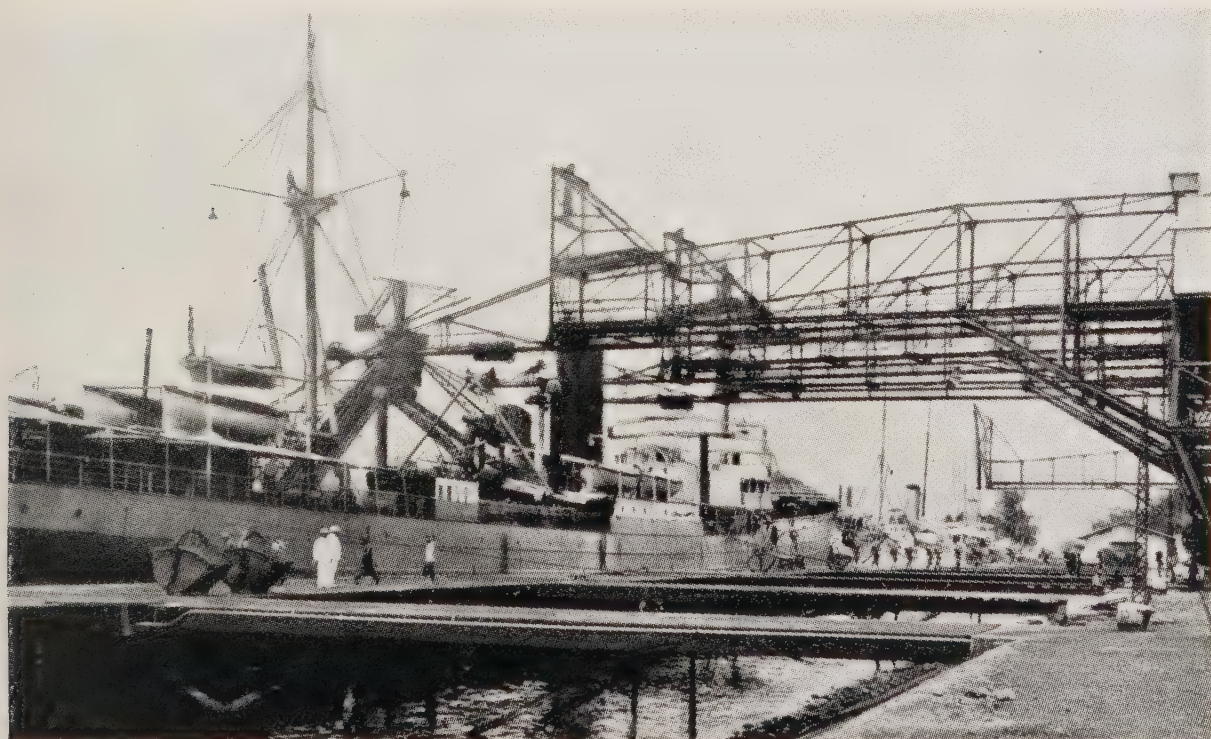


Plate 78. Sabang: vessels at the coaling wharves

The loading of coal is facilitated by electric coal transporters seen in the photograph.



Plate 79. Belawan: Ocean Quay



Plate 80. Belawan: government wharves
Two K.P.M. vessels are berthed alongside.

connected by three gangways. Along the river bank above the wharf are three piers and below it is a government jetty. There are from thirty to forty lighters and ten motor boats available as harbour craft. Only small vessels can use Pangkalanbrandan, and all large vessels call at Pangkalansoesoe.

Pangkalansoesoe, situated east of the mouth of the Soengai Besitan at the head of Aroe bay, is accessible to vessels with a draught of about 19 ft. The port is approached by way of the Sembilan channel south of Poelau Sembilan; in the fairway off this island anchorage may be obtained in a depth of about 3 fm. There is a tidal rise of from 5 to 7 ft. At the lower end of the port is a T-shaped government jetty, suitable for small freighters. South-west of this jetty is the B.P.M. wharf, which is 600 ft. long and connected with the shore by gangways; it is equipped with a motor-driven crane, with a lifting capacity of about 10 tons. The depth of water alongside is about 21 ft. at M.L.W.S.; ships with a length of 500 ft. can turn in front of this wharf. Further upstream are three jetties, the first two being 240 ft. long and the third 120 ft. long. A number of lighters serve as harbour craft.

The oil refineries at Pangkalanbrandan have an approximate capacity of 19,000 barrels daily. A pipe-line carries the refined product to Pangkalansoesoe, where there is a tank farm capable of storing 36 million gallons of oil. Tankers of 12,000 tons displacement call at the port and take on up to 6,500 tons of oil.

Pangkalanbrandan is connected by railway and road with Pangkalansoesoe and with Medan. The government wharf at Pangkalansoesoe is served by a branch railway line.

BELAWAN

Lat. $3^{\circ} 47' N$, Long. $98^{\circ} 41' E$. Population: no information.

Admiralty Chart 1353. Fig. 83. Plates 79–80.

The port of Belawan stands on an island at the mouth of the Belawan and Deli rivers in eastern Sumatra. It is the first port of Sumatra in tonnage of shipping entered and cleared and is the outlet for the important plantation region centring on Medan.

Approach and Access

The coast and coastal plain in the vicinity of Belawan is for the most part low, swampy and covered with mangroves. The two low promontories of Tg. Betingtjamar and Tg. Perling, marking the approach to the Belawan river, are scarcely discernible from the

open sea. The channel of approach to the port lies between the sand and mud banks which extend some distance offshore from these promontories. Constant dredging is necessary to prevent silting. This channel is 164 ft. wide and has a depth of 27 ft.; it is well marked and lighted.

The tides are predominantly semi-diurnal and there is a tidal rise of from 8 to 11 ft. At the entrance to the dredged channel the ebb stream attains a rate of 3 knots at springs, and the flood stream rather less than 2 knots.

Detailed Description

The port extends along the northern and western side of the small island of Belawan. On the northern side of the island is the Ocean Quay with a frontage of 3,225 ft. and a depth of about 25 ft. alongside. At the western end of this quay is the New Wharf or Oceaasteiger (Ocean Jetty), 590 ft. long with a depth of 12½ ft. alongside. Further to the west are two coaling jetties and a harbour for praus. On the western side of Belawan island the length of quayage is 2,625 ft., with depths of from 17 to 24 ft. alongside. Much of the quayage, here, however, has been demolished or become derelict. The harbour master's office is beside the New Wharf.

Port Facilities

There are seven cranes of which one is a 50-ton floating crane and four are 2½-ton electric cranes; the other two cranes are of 10 tons and 3 tons capacity. Warehouse accommodation is extensive. Four tugs and ten lighters are available as harbour craft.

Coal can be taken on at the jetties just to the west of the New Wharf and oil at the Ocean Quay. Water is plentiful at the quay.

Repairs to tugs and lighters are carried out at a government slipway, 82 ft. long and 16 ft. wide. It can take ships of up to 100 tons.

Trade

In 1938 Belawan was the third port of Sumatra in tonnage of foreign trade. It exported 368,788 tons and imported 194,847 tons in this year. The exports largely consisted of agricultural products such as rubber, tea, palm oil and tobacco from the plantations in the hinterland; the imports were mainly foodstuffs and manufactured products.

The tonnage of shipping calling at Belawan is greater than at any other port in Sumatra, 3,531,694 tons entering and clearing the port in 1938. In the twenty years before the outbreak of the present war the tonnage of shipping increased more than five times.



Fig. 82. Pangkalanbrandan (Pangkalansoesoe)

Source: Admiralty Chart 3574 (1934, corrected to 1941).

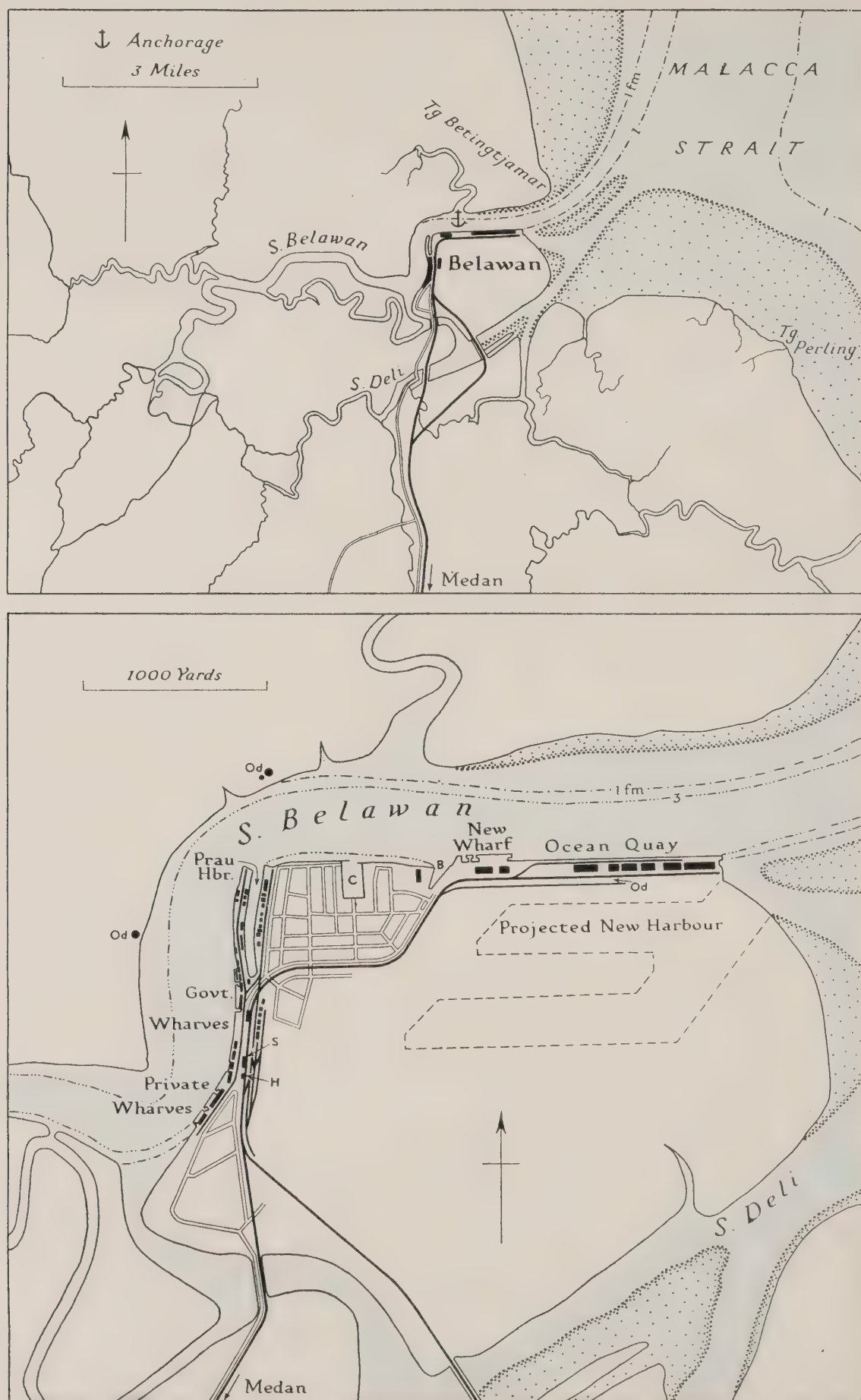


Fig. 83. Belawan

B. Building slip; 3. Constructing basin; H. Harbour master's office; Od. Oil depot; S. Railway station.

Source: (1) Admiralty Chart 1353 (1897, corrected to 1938); (2) Official sources.

Communications

Railway lines serve all the main quays and wharves at Belawan. From the railway station, which lies close to the quays on the western side of the island, a line runs south to Medan, the capital of Sumatra, about sixteen miles inland. This is a branch line of the privately-owned Deli railway. Belawan and Medan are also linked by a broad asphalt road suitable for a fast two-way traffic.

There is a seaplane anchorage on the river at Belawan, with calm water at all seasons.

TANDJOENGBALAI

Lat. $3^{\circ} 1' N$, Long. $99^{\circ} 52' E$. Population, 6,823 (1930).

Admiralty Charts 794, 1355. Fig. 84.

Tandjoengbalai, a small port in the south of the Oostkust Residency, stands on the left bank of the Soengai Asahan about seven miles above its mouth. The approach to the mouth of the river is made



Fig. 84. Tandjoengbalai and Laboehanbilik

Source: (1) Admiralty Chart 794 (1895, corrected to 1940); (2) East Coast of Sumatra, 1 : 100,000 (G.S.G.S. 4292).

difficult by shifting channels; there are no prominent features to mark the entrance, as the coast in the vicinity is low and covered with mangroves. The minimum depth in the river up to the port is about 4 ft. At Tandjoengbalai is a wharf alongside which small coasting vessels can lie in a depth of 3 ft.; at Teloekniboeng, four miles downstream, is another wharf, 360 ft. long.

Agricultural products grown in the plantations of the upper Asahan valley are sent to Tandjoengbalai for shipment overseas. Tobacco and copra figure largely among the exports. In 1938 the port handled 82,759 tons of foreign trade.

Tandjoengbalai is in communication by rail and road with Medan. There are regular steamship services with Belawan, Penang and Singapore.

LABOEHANBILIK

Lat. $2^{\circ} 31' N$, Long. $100^{\circ} 10' E$. Population: no information.

Admiralty Charts 794, 1355. Fig. 84.

Laboehanbilik lies about twelve miles from the sea where the waters of the Soengai Bila and the Soengai Baroemen unite to form the broad estuary of the Soengai Panai. The country surrounding the port is low-lying, swampy and covered with mangroves. Anchorage may be obtained off Laboehanbilik in depths of from 2 to $2\frac{1}{2}$ fm., but the approach from the sea requires great care owing to the shifting nature of the channels in the estuary. There is a small pier owned by the customs authorities.

In 1938 Laboehanbilik handled 51,203 tons of foreign trade, exports comprising the greater part of this total. Rubber and palm oil from neighbouring plantations are the principal exports.

There are no railway connections at Laboehanbilik. A road runs inland to Rantauparapat, the southern terminus of the Deli railway.

RENGAT

Lat. $0^{\circ} 23' S$, Long. $102^{\circ} 32' E$. Population c. 2,000 (1930).

Admiralty Chart 1789. Fig. 85.

Rengat lies about ninety miles from the mouth of the Soengai Inderagiri in eastern Sumatra. The plain through which the river flows is low, swampy and covered with mangroves. Vessels with a length of 200 ft. and a draught of 10 ft. can sail from Amphitrite bay at the mouth of the Inderagiri as far as Teloekbagoes, about twenty-five

miles below Rengat. The roadstead off Rengat can take vessels of about 6 ft. draught only; alongside the jetty at the port there is a depth of 3 ft.

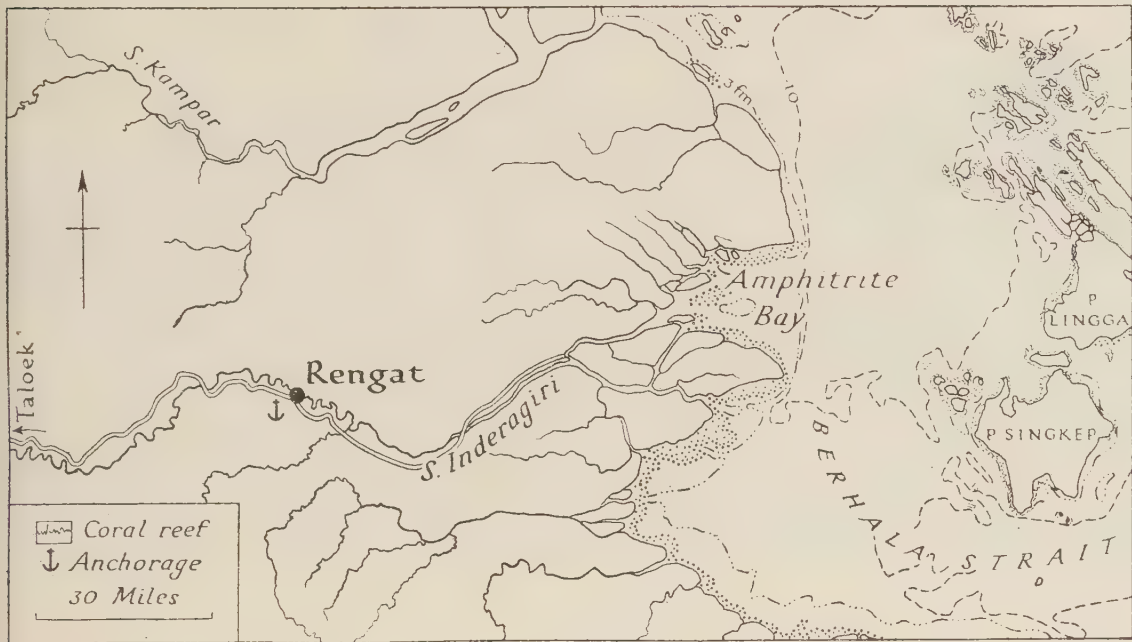


Fig. 85. Rengat

Source: Admiralty Chart 1789 (1904, corrected to 1941).

In the Inderagiri valley above Rengat are rubber and gambir plantations and these two products are among the chief exports from the port. In 1938 the total foreign trade amounted to 20,836 tons.

A road runs westwards from Rengat up the Inderagiri valley to Talook in the foothills of the Barisan range. Work has been begun on the construction of a road between Rengat and the coast.

DJAMBI

Lat. $1^{\circ} 35' S$, Long. $103^{\circ} 33' E$. Population, 22,071 (1930).

Admiralty Chart 2757. Fig. 86.

Djambi, the capital of the residency of the same name, stands on the banks of the Batang Hari about eighty miles from its mouth. This river, which is the longest in Sumatra, enters Berhala strait, between the Lingga archipelago and the mainland, by two main channels. Both have winding courses. The more westerly of the two is the usual route taken by vessels proceeding to the port; the other channel, Batang Berbak, is difficult to enter on account of drying mudbanks and is only accessible to vessels of light draught with local knowledge. Although the course followed by the Batang Hari to

Djambi is rather tortuous in parts, vessels with a draught of about 11 ft. can reach the port with little difficulty. There is a pier and in the roadstead a floating stage where vessels can moor. The



Fig. 86. Djambi

Source: (1) Admiralty Chart 794 (1895, corrected to 1940); (2) Sumatra 1 : 100,000 (G.S.G.S. 4198).

river is here over 300 yards wide. Above Djambi, the Batang Hari is navigable for light draught vessels to Moearatebo, some 150 miles upstream, and for native craft as far as the foothills of Barisan mountains.

The products of the Batang Hari valley come to Djambi for shipment overseas. In 1938, 22,647 tons of goods were exported. The imports in this year amounted to 26,578 tons.

Djambi is linked by road with the valley of the upper Batang Hari and with the region of the Padang Highlands. The only communication with the coast is by water. There is a landing ground for aircraft four miles south of the port.



Plate 81. Tandjoengbalai

The *Jarak* is a Straits Line steamer of 208 tons gross.



Plate 82. Palembang: government wharf

The wicker-work baskets on the wharf carry pigs imported from Bali.



Plate 83. Palembang: Pladjoe oil installations

The oil installations lie at the confluence of the Moesi and Komering rivers. The Moesi is the broader of the two rivers.

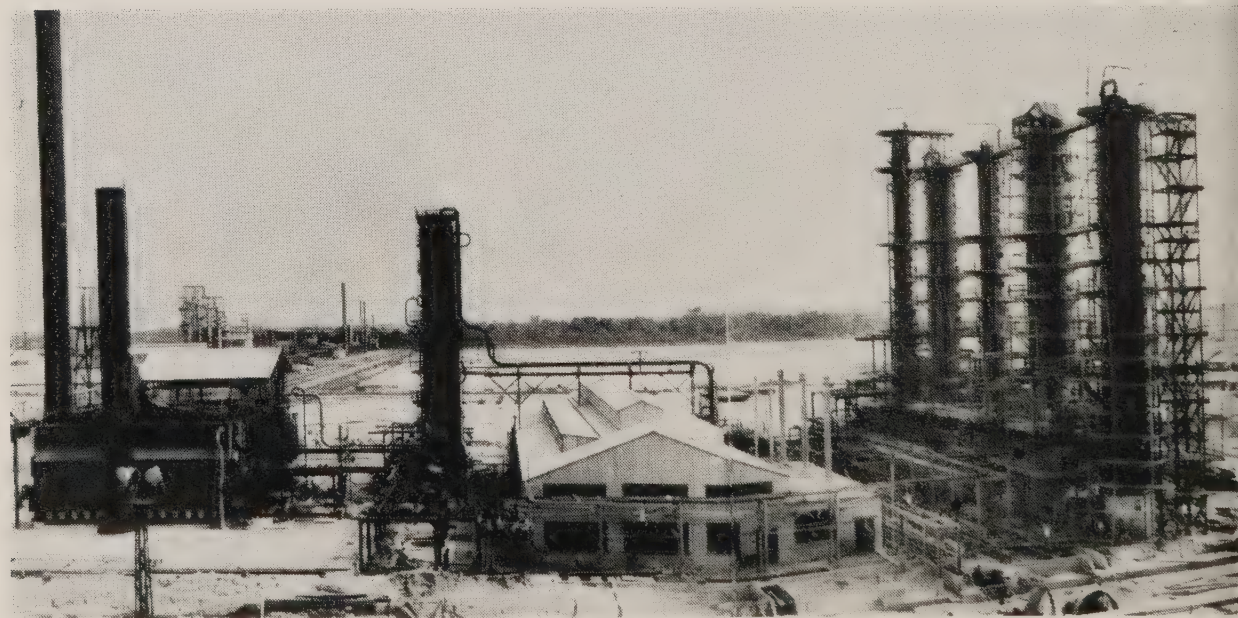


Plate 84. Palembang: Pladjoe oil refinery

This refinery has an approximate maximum capacity of 45,000 barrels of oil a day.

PALEMBANG

Lat. $2^{\circ} 59' N$, Long. $104^{\circ} 46' E$. Population, 108,145 (1930)

Admiralty Chart 3471. Fig. 87. Plates 82-84.

Palembang is situated on the Air Moesi about fifty miles above its mouth where the right bank tributaries, the Air Ogan and Air Komering, join the main stream. It is the leading port and largest town in Sumatra and the capital of the Residency of the same name.

Approach and Access

The Air Moesi or Palembang river, which flows into Bangka strait, is entered between the two low headlands of Tg. Gedeh and Tg. Tjarat, almost due north of the port. The mouth of the river is obstructed by a bar, through which a channel has been dredged to give a depth of about 22 ft. at M.H.W.S. Vessels proceeding to Palembang use the channel eastward of Poelau Pajoeng, which lies just within the entrance to the river; out-going vessels follow the channel to the west of this island. From Poelau Pajoeng upstream the channel of the river follows a somewhat circuitous course, but the general direction is north-south as far as the confluence with the Air Komering, beyond which it first runs east-west, and then curves north-east-south-west at Palembang. Vessels with a draught of from 20 to 23 ft. can reach the port.

The tides in the Air Moesi are of mixed character, sometimes semi-diurnal and sometimes diurnal. The ebb stream usually flows at a rate of 2 knots and the flood stream at from one to one and a half knots. The influence of the tides extends upstream to Palembang.

Detailed Description

The port of Palembang extends for several miles along both banks of the Air Moesi. The main government wharf lies on the north or left bank at the lower end of the town; it is 810 ft. in length with a depth alongside of about 23 ft. When there is no room available for ships at the wharf they remain at anchor in the river and load and discharge on both sides by means of lighters. Along the banks of the river above the government wharf are a number of small piers and jetties. At the upper end of the town, on the right bank where the Air Ogan joins the main stream, is the suburb of Kertapati, the terminus of the railway from Batoeradja and Oosthaven. Here there are two wharves, each 164 ft. in length with a minimum depth of 20 ft. alongside the lower one and 16 ft. alongside the upper one.

At Bagoeskoening, Pladjoe and Soengaigerong on the right bank

of the Air Moesi below Palembang are wharves for the shipment of oil. The wharves have a minimum depth of 23 ft. alongside.

Port Facilities

At Kertapati there are two cranes each with a lifting capacity of 6 tons, and at Pladjoe six electric cranes. Coal can be taken on at Kertapati. Fuel oil is available in large quantities at the port.

Small repairs to vessels can be carried out. There are five slipways for vessels up to 100 ft. in length.

The Town

The town of Palembang stretches along the banks of the Moesi in a narrow band. Many of the houses stand on piles or on rafts in the river. The main part of the town lies on the left bank and centres round the Kraton, the former residence of the sultan, built in 1780. Most of the Europeans live in this district and here also are the government buildings and harbour offices. The dwellings of the natives and Chinese are found mainly on the right bank of the river.

Trade

In tonnage of foreign trade Palembang is the first port in the Netherlands Indies, but it is sixth in tonnage of shipping. Its total foreign trade in 1938 amounted to 3,109,594 tons, which was more than two and a half times the tonnage handled at Soerabaja, and nearly five times that at Tandjoengpriok. The bulk of the trade of Palembang is taken up with the export of petroleum and petroleum products, nearly three million tons being exported in 1938. The petroleum is exported chiefly in the form of gasoline. Rubber, coffee and coal also figure in the list of exports. The chief imports are minerals and foodstuffs.

The number and tonnage of steamships calling at Palembang more than trebled in the two decades before the outbreak of the present war. This increase is shown in the following table:

	Steamships	
	No.	Tonnage
1920	566	344,876
1925	628	646,289
1934	1,309	1,774,911
1935	1,317	2,056,183
1936	1,385	2,240,636
1937	1,546	2,573,498

Source: *Indisch Verslag*, 1938, vol. II, p. 368 (Batavia, 1938)

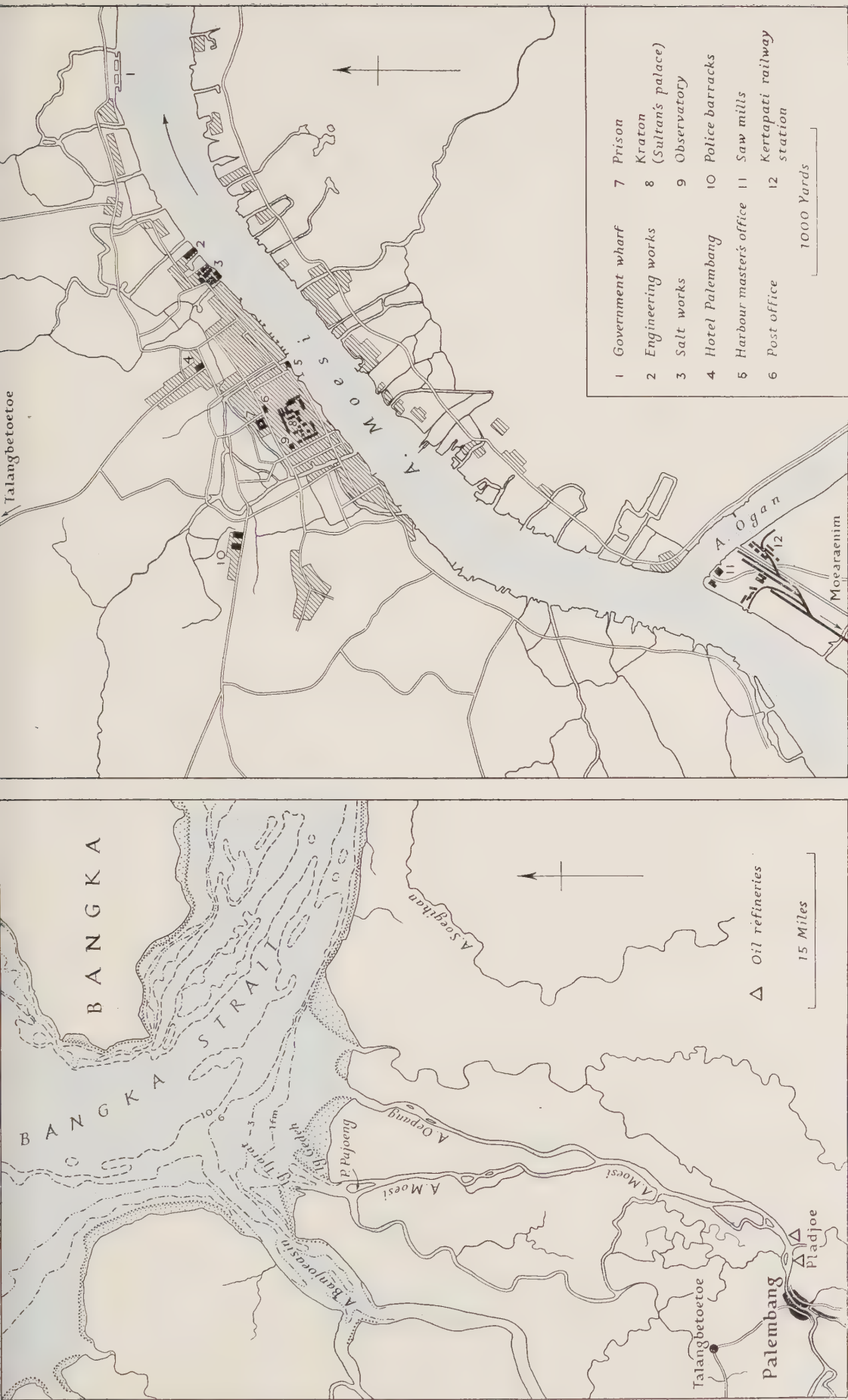


Fig. 87. Palembang
 Source: (1) Admiralty Chart 3471 (1942); (2) Official sources.

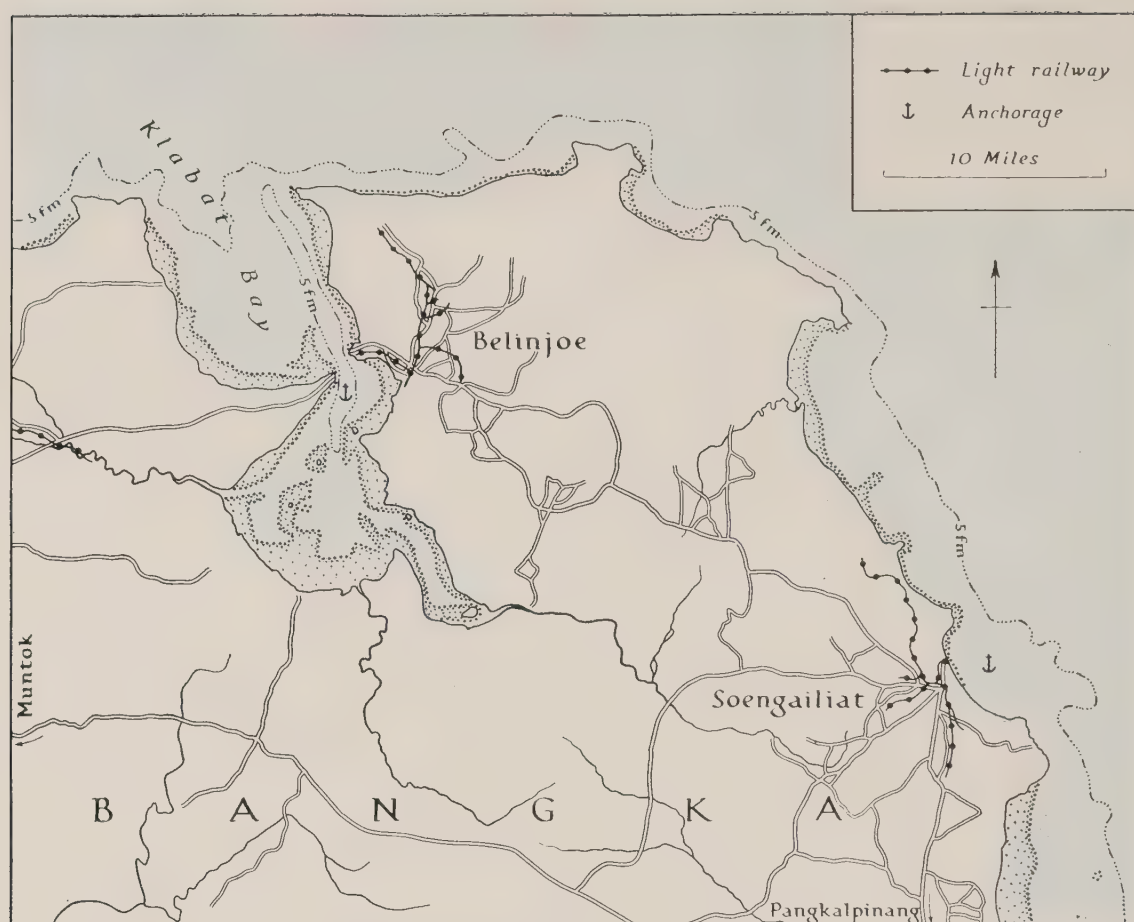


Fig. 88. Belinjoe and Soengailiat

These are the two chief ports which handle the export of tin from the rich mines on Bangka. The light railways link the ports with the mining regions.

Source: (1) Admiralty Chart 2757 (1918, corrected to 1943); (2) *Overzichtskaart van het Gewest Bangka en onderhoorigheden*, 1 : 150,000.

The remarkable growth in shipping in recent years is related to the increase in the output of petroleum from the Moearaenim and other fields of southern Sumatra during this period (see p. 257). Palembang is now the largest exporter of petroleum in the Netherlands Indies.

Industries

The principal industrial establishments are the oil-refining plants at Bagoeskoening, Pladjoe and Soengaigerong to the east of Palembang. Crude oil is piped to the refineries from fields to the west and north of the port. The refineries at Pladjoe and Soengaigerong each have an approximate maximum capacity of 45,000 barrels daily (Plates 83, 84).

Palembang itself has a number of small industries, such as weaving, lace manufacture and copper and silver working. There are also eight repair shops and eleven sawmills.

Communications

Palembang is connected by railway with Moearaenim and Batoeradja at the foot of the western mountains and with the port of Oosthaven on Soenda strait. The railway station is at Kertapati on the right bank of the river. There is a ferry service linking this suburb with the main part of the town. A number of roads converge on Palembang from the north-west, west and south. The only means of communication with the coast of Bangka strait is by water, as the surrounding land is extremely low-lying and largely covered with mangroves.

During the season of the west monsoon, from December to April, the Air Moesi and its tributaries provide an extensive system of inland waterways, the traffic of which converges on Palembang. The Moesi itself is navigable for small craft with a draught of 3 ft. up to Moearaklingi, 160 miles above the port, and its tributary, the Air Lematang, is navigable as far as the coal mining centre of Moearaenim. Of its other tributaries, the Air Ogan is navigable during this season to Batoeradja and the Air Komering to the confluence with the Soengai Babatan. In the season of the east monsoon navigation on these rivers is restricted by the lowness of the water-level.

At Talangbetoetoe, ten miles north-west of Palembang, is a civil aerodrome, used by the K.N.I.L.M. There is a seaplane anchorage at the port.

BELINJOE

Lat. $1^{\circ} 37' S$, Long. $105^{\circ} 48' E$. Population: no information.

Admiralty Chart 2149. Fig. 88.

Belinjoe is a small port on the eastern side of Klabat bay on the north coast of Bangka. The bay extends in a north-south direction for about twenty miles and is divided into an outer and inner section by the low promontory of Tg. Roeh. Eastwards of this promontory is the sheltered roadstead of Belinjoe, which affords anchorage in depths of from 5 to 10 fm. There is a small pier for boats at the entrance to the river on which Belinjoe stands.

Tin ore is the principal export of Belinjoe and the town lies in the centre of a tin mining district. Roads connect the town with all parts of the island. There are four mooring buoys for seaplanes in the roadstead.

SOENGAILIAT

Lat. $1^{\circ} 51' S$, Long. $106^{\circ} 7' E$. Population: no information.

Admiralty Chart 2149. Fig. 88.

Soengailiat lies about two miles above the mouth of a small stream which flows into a bay on the east coast of the island of Bangka. The river is shallow and can only be reached by small craft at high water. Larger ships moor in the bay in depths of 4 fm. The approach to the anchorage is difficult on account of reefs and shoals.

Tin mining is the most important industry on Bangka and tin ore comprises the bulk of the exports from Soengailiat. In 1938, the foreign trade of the port amounted to 17,345 tons.

Soengailiat is in communication by road with the chief mining settlements in Bangka.

TANDJOENGPANDAN

Lat. $2^{\circ} 45' S$, Long. $107^{\circ} 38' E$. Population, 15,708 (1930)

Admiralty Chart 3597. Fig. 89. (Plate 85).

Tandjoengpandan is the main port and town on the island of Billiton, one of the co-called 'tin islands' off the east coast of Sumatra. It is situated at the mouth of the Soengai Tjeroetjoep on the west coast of the island. The approach to the port is by a narrow channel between coral reefs and a drying shore bank. There is good anchorage in this channel in a depth of $3\frac{1}{4}$ fm. At Tandjoengpandan two piers extend

southwards into the river where there are depths of from $1\frac{1}{4}$ to 2 fm. East of the piers is a small dry dock.

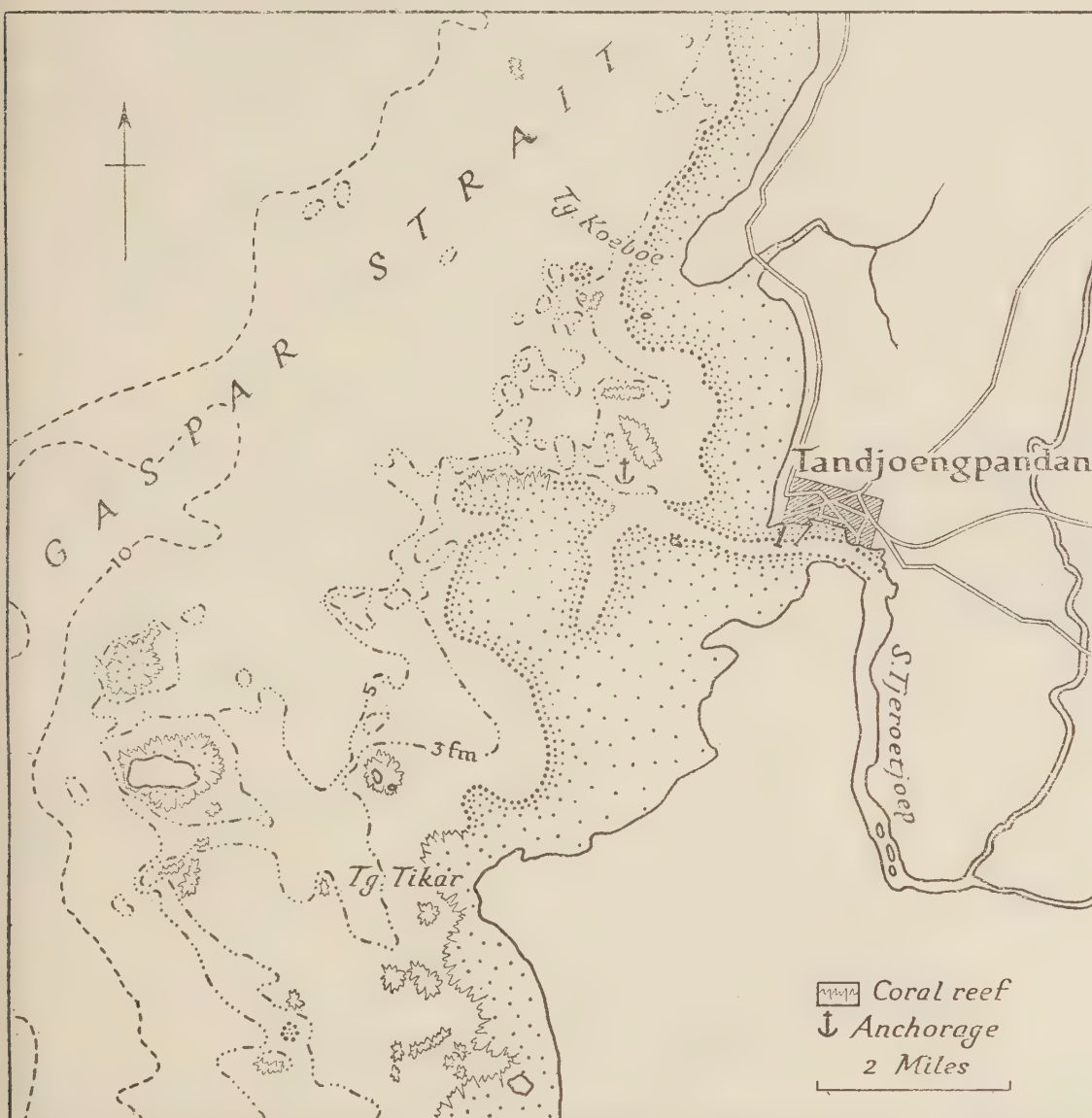


Fig. 89. Tandjoengpandan

Source: (1) Admiralty Chart 3597 (1906, corrected to 1938); (2) *Topografische Kaart van het eiland Billiton*, 1 : 200,000 (G.S.G.S. 4264).

In 1938, Tandjoengpandan handled 28,917 tons of foreign trade. The export of tin made up the greater part of the trade.

Tandjoengpandan is connected by road with all parts of Billiton. There is a seaplane anchorage at the port.

TELOEKBETOENG (OOSTHAVEN)

Lat. $5^{\circ} 27' S$, Long. $105^{\circ} 16' E$. Population, 25,170 (1930)

Admiralty Charts 2056, 3611. Fig. 90.

Teloekbetoeng, at the mouth of a small river entering the head of

Lampoeng bay, is the capital of the Lampoeng Residency of southern Sumatra. Its port is at Oosthaven, about six miles distant, on the eastern side of the bay, for the pier at Teloekbetoeng has a depth of only 4 ft. at its head and is unsuitable for landing cargo. The harbour at Oosthaven, which is sheltered by a natural breakwater of drying coral reef, is 3,000 sq. ft. in area, with an entrance from the north, 750 ft. wide. Within the harbour, vessels can anchor in depths of from 5 to 7 fm. On the south-eastern side of the harbour is a wharf, about 550 ft. long, with a depth of 35 ft. alongside. North of this wharf is another wharf for smaller vessels and a jetty for praus. Mooring buoys lie offshore near the wharves.

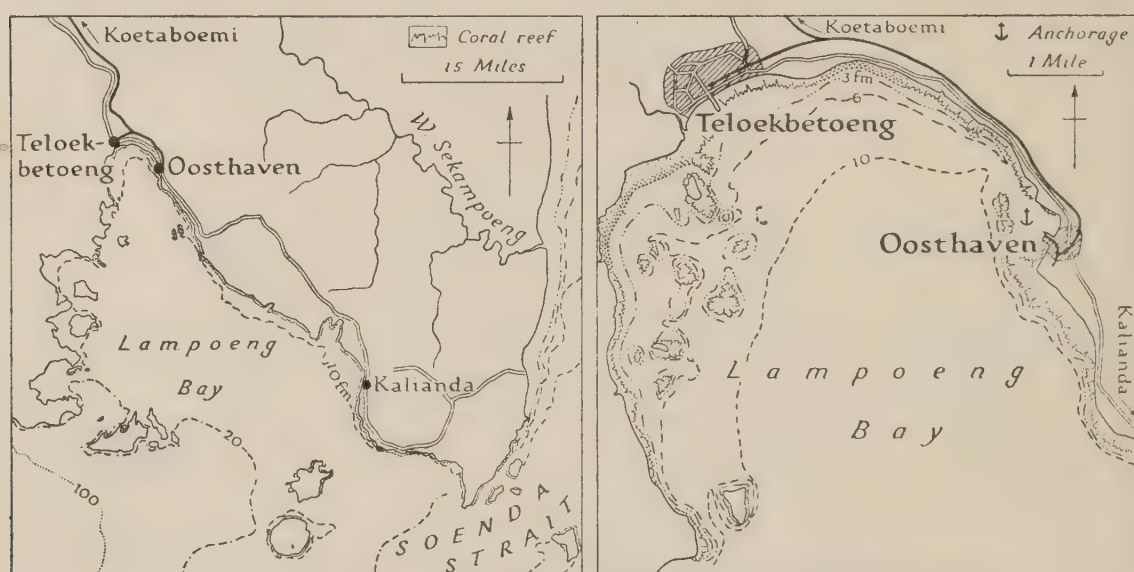


Fig. 90. Teloekbetoeng (Oosthaven)

Source: (1) Admiralty Chart 3611 (1906, corrected to 1932); (2) Sumatra 1 : 100,000 (G.S.G.S. 4278).

The main wharf at Oosthaven is equipped with one 5-ton crane and there is a large storage shed. Water is laid on at this wharf. A number of motor launches and praus are available as harbour craft. Small repairs can be executed at a slipway and repair shop.

In 1938 the foreign trade of Oosthaven amounted to 62,419 tons, over four-fifths of which were exports. Agricultural products, especially pepper, constituted the bulk of the exports.

Oosthaven is linked with Teloekbetoeng by both railway and road. The road is of asphalt and is wide enough for two cars to pass with ease. North of Teloekbetoeng is a landing ground for aircraft.

PADANG (EMMAHAVEN)

Lat. $0^{\circ} 59' S$, Long. $100^{\circ} 22' E$. Population, 52,054 (1930).

Admiralty Chart 709. Fig. 91. Plate 86.

Padang is the largest and most important town on the west coast of Sumatra. It is attractively situated on the right bank of the Batang Arau, which enters the sea immediately north of the prominent cape known as Apenberg head. Only small craft can enter the river at Padang and its port is at Emmahaven in the sheltered Koninginne bay, about three miles to the south.

Detailed Description

The port of Emmahaven has been constructed on the western side of Koninginne bay and is backed by forested hills. Coral reefs fringe the shores of a large part of the bay. The harbour is partly enclosed by two breakwaters, the one 2,640 ft. long and the other 810 ft. long; the shorter of the two is built on a reef in the centre of the bay. On the shore facing south-eastwards are three wharves with depths of about 32 ft. alongside; three vessels with a length of 400 ft. can be accommodated. Northward of these is a coaling jetty. Where the main

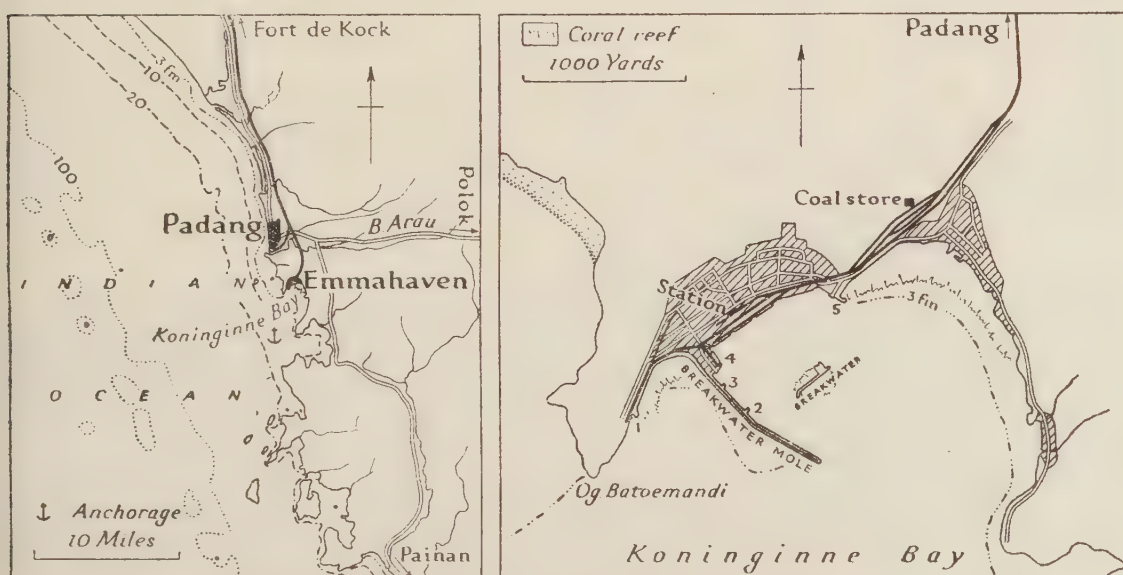


Fig. 91. Padang (Emmahaven)

1. Oil Depot; 2. Explosives Pier; 3. Oil Jetty; 4. Harbour Offices; 5. Coaling Jetty. The three main commercial wharves lie between the harbour offices and the coaling jetty.

Source: (1) Admiralty Chart 709 (1899, corrected to 1930); (2) Official sources.

breakwater extends into the bay is another wharf, facing north-east with a similar depth of water alongside; on this wharf are the harbour offices. Facing south-east, at right angles to this wharf, is a jetty with

a depth alongside of 20 ft. and two other jetties, the one for oil and the other for explosives, extend from the northern side of the main breakwater. A wharf has been constructed on part of the western side of the small breakwater. A number of mooring buoys lie off the main wharves to assist vessels securing alongside and to keep vessels off the wharves when there is a strong swell running in the harbour.

Port Facilities

The port facilities include two electric cranes, each with a capacity of 8 tons, on the main wharves and three elevated coaling transporters, on the coaling jetty. Six large sheds are available on the main wharves for the storage of goods. Adequate stocks of coal and oil are kept for bunkering purposes. Fuelling is by pipe-line from a pontoon alongside a breakwater. Water is laid on at the wharves. Small repairs can be carried out at a slipway close to the wharf on the smaller of the two breakwaters.

Trade

In the hinterland of Emmahaven are the Padang Highlands, a region more highly developed economically than any other part of western Sumatra. Coffee, tobacco, copra and forest products are sent to the port from this region. With the recent opening up of the Oembilin coalfield in the eastern part of this region, coal has become a leading item in the export trade of Emmahaven. The imported goods are mainly manufactured products and certain foodstuffs. In 1938, the total foreign trade of the port amounted to 99,033 tons.

Communications

Emmahaven is connected by railway with Padang and from there with Fort de Kock and Sawahloento in the Padang Highlands. The main wharves and the coaling jetty at the port are served by branch railway lines. No main road links the port with the town, but Padang itself has good road connections with most parts of Sumatra. There is a civil aerodrome six miles east of Padang and a seaplane anchorage at Emmahaven.

SIBOLGA

Lat. $1^{\circ} 44' N$, Long. $98^{\circ} 46' E$. Population, 10,765 (1930).

Admiralty Chart 3851. Fig. 92. Plate 87.

The port of Sibolga is situated at the north-eastern end of Tapanoeli bay on the west coast of Sumatra about 230 miles north of Padang.



Plate 85. Tandjoengpandan

View looking south-west. The mouth of the Soengai Tjeroetjoep is on the left.



Plate 86. Emmahaven

The photograph shows part of the main commercial wharves. A vessel of the K.P.M. is berthed alongside. The building in the left centre is the harbour office.



Plate 87. Sibolga

Looking south-westwards over Tapanoeli bay. The town and port of Sibolga lies at the head of the bay, sheltered by the two small coral-fringed islands.



Plate 88. Pontianak: aerial view looking south

The Soengai Kapoeas is in the foreground.

The main approach to the port lies between Oedjoeng Karang, at the northern entrance to the bay, and a coral-fringed islet. The roadstead is well sheltered and affords secure anchorage in a depth of from 6 to 7 fm. Off Sibolga is a cove, about 2 cables wide, and bounded to the north and south by a shore reef. A small T-shaped wooden pier, 180 ft. long and 12 ft. wide, extends from the shore; there is also a stone jetty, on which is a pipe-line from two oil tanks nearby.

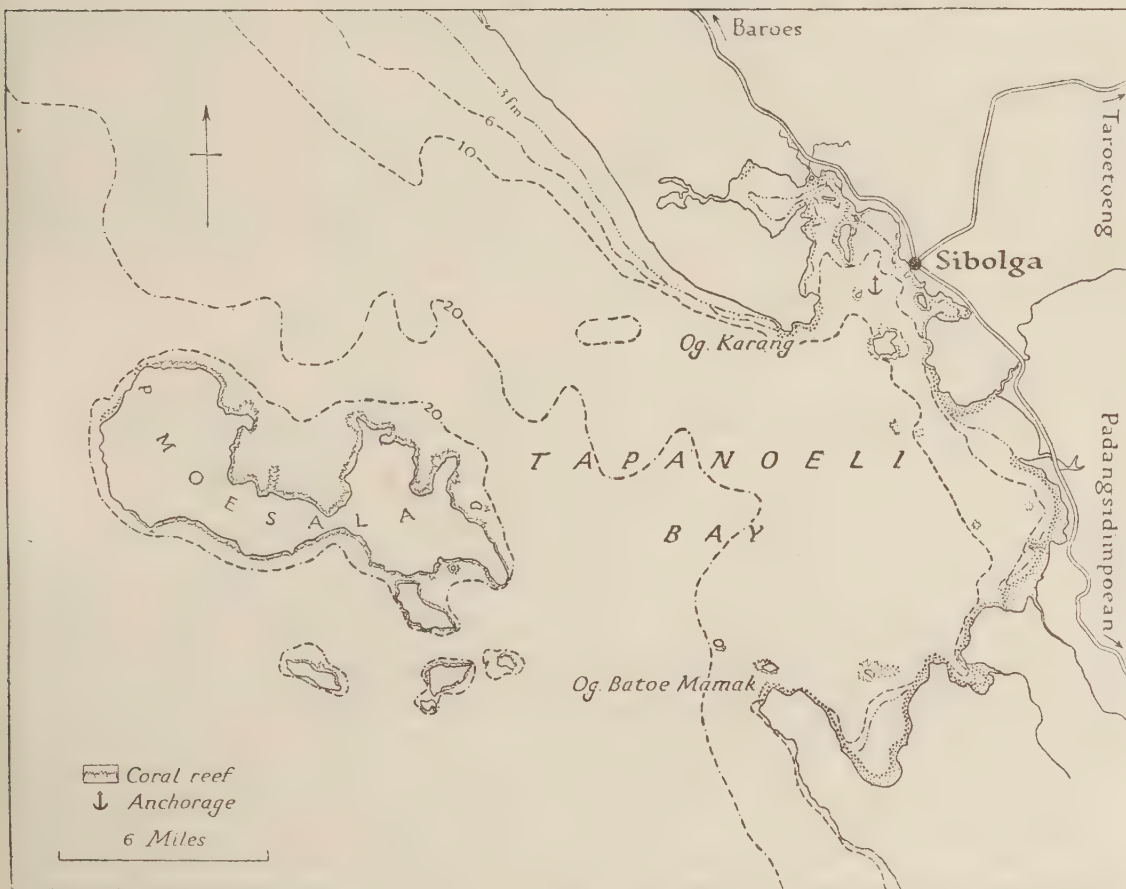


Fig. 92 Sibolga

Source: Admiralty Chart 3851 (1927, corrected to 1938).

Cargo is discharged on to the wooden pier by lighters from ships moored in the roadstead. Harbour craft includes ten lighters of approximately 5-ton capacity and one motor boat. The pier is equipped with a crane of 3 tons capacity. Near the stone jetty are five or six warehouses. Two oil storage tanks, connected by pipe-line with the jetty, lie about half a mile south of the town.

The foreign trade of the port is quite small, only 14,029 tons of goods being entered and cleared in 1938. The trade is confined mainly to the export of agricultural products.

Sibolga is the capital of Tapanoele Residency and is the most

important town on the west coast of Sumatra north of Padang. It is in communication by road with Medan by way of the Batak plateau and with Padang by way of the Padang Highlands. There is a seaplane anchorage in the roadstead off Sibolga.

PORTS OF BORNEO

Of the four ports of Borneo mentioned in the official trade statistics, two, Balikpapan and Lingkas (Tarakan), have an annual foreign trade of over half a million tons. The two other ports, Pontianak and Bandjermasin, handled less than 150,000 tons of goods in 1938. The development of rich oilfields and the extension of plantation agriculture has led to the growth in the trade and prosperity of these ports.

PONTIANAK

Lat. $0^{\circ} 1' S$, Long. $109^{\circ} 21' E$. Population, 45,196 (1930).
Admiralty Chart 3720. Fig. 93. Plate 88.

Pontianak, the chief port of western Borneo, is situated about ten miles from the sea on a navigable channel, the Kapoeas-ketjil, in the northern part of the delta of the Soengai Kapoeas. The entrance to the Kapoeas-ketjil is obstructed by a bar through which a channel has been dredged with a least depth of 7 ft.; there is a least depth of 20 ft. upstream to Pontianak. In the roadstead off the entrance to the river vessels anchor in depths of about 10 fm.; off Pontianak there is anchorage with adequate swinging room in depths of from 9 to 10 fm. The port lies on both sides of the river and on the southern side is a government pier, 950 ft. long with depths of from 1 to 9 ft. alongside. There are also several landing stages. Coal and fuel oil can be taken on. On the northern bank is a government dry dock, 208 ft. long and 27 ft. wide.

In the hinterland of Pontianak is the plantation region of the middle Kapoeas valley, centring on the small town of Sintang. The products of this region are brought to the port by water, the S. Kapoeas being navigable at all seasons for a considerable distance upstream. Rubber and copra are the principal exports. In 1938, the total exports amounted to 72,885 tons; the imports, comprising mainly manufactured products, totalled 47,276 tons in this year.

Pontianak is in communication by road with Singkawang, a coastal town in the Sambas district, and with Soengaikakap near the mouth

f the Kapoeas-ketjil. The only means of communication inland is
y water. There is a seaplane anchorage in the river off the port.

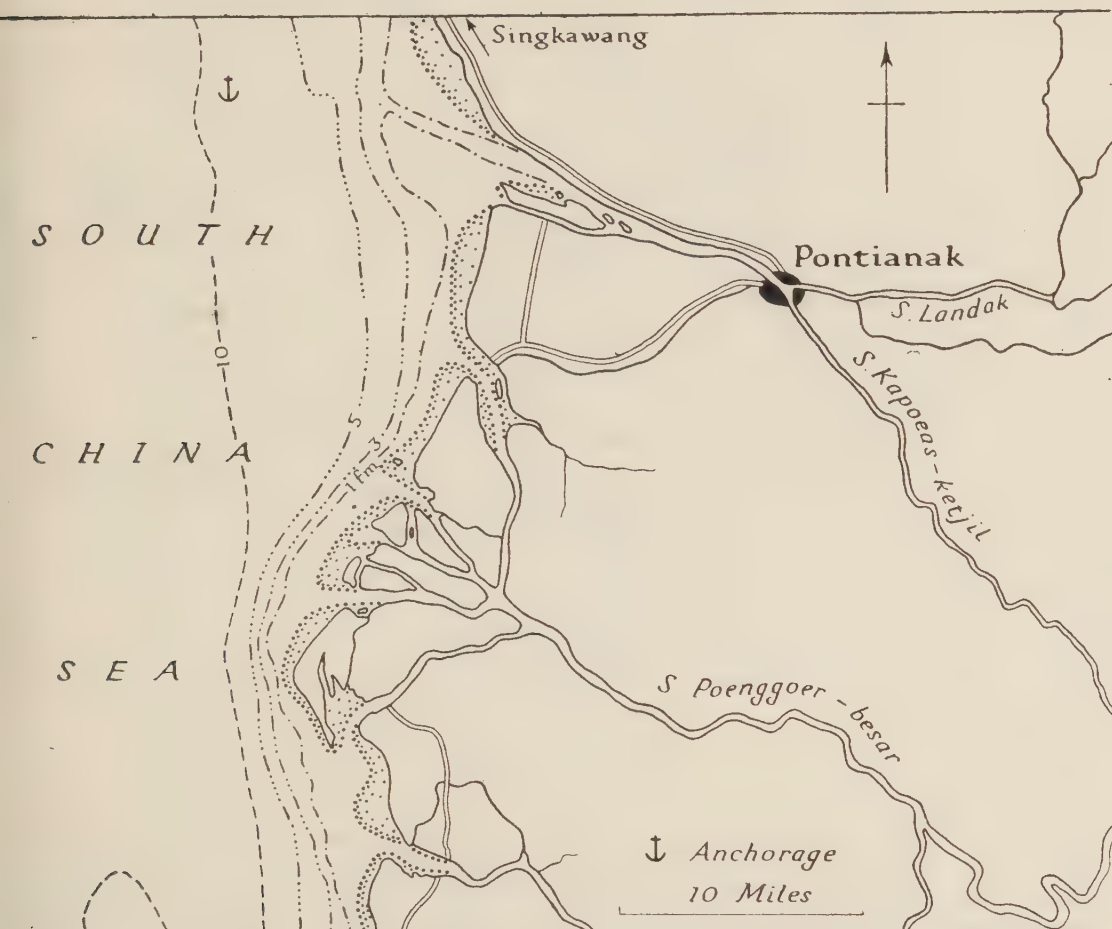


Fig. 93. Pontianak

Source: Admiralty Chart 3721 (1909, corrected to 1940).

BANDJERMASIN

Lat. $3^{\circ} 20' S$, Long. $114^{\circ} 35' E$. Population, 65,698 (1930).

Admiralty Chart 3029.

Fig. 94.

The port and town of Bandjermasin lies fourteen miles from the sea on the right bank of the S. Martapoera, a tributary of the S. Barito, the most important river on the south coast of Borneo. It is the largest town and one of the oldest trading centres in the island.

Approach and Access

The S. Barito is fronted by a bar at its mouth, over which there is a depth of about 11 ft. at M.L.W.S. The tidal rise is from 4 to 5 ft. On the inner side of the bar the channel of approach follows first the middle of the river then runs close to the right bank near Poelau Temporoeng-Besar. From the confluence of the S. Martapoera

with the main stream the channel to the port narrows considerably and has numerous bends. Vessels with a draught of about 13 ft. can reach Bandjermasin. The river is 300 ft. wide at the port.

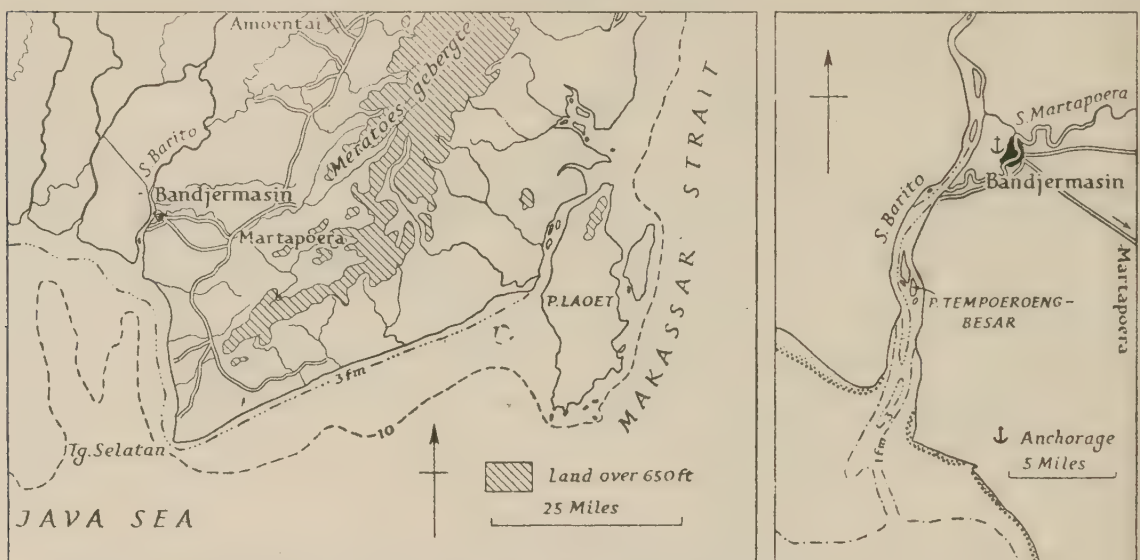


Fig. 94. Bandjermasin

Source: Admiralty Charts 941B (1923, corrected to 1941) and 3029 (1910, corrected to 1939).

Detailed Description

On the right bank of the river near the customs office is the main commercial wharf, 600 ft. in length with a depth of 11 ft. alongside; a number of piers, with depths of from 10 to 13 ft. at their head, extend from this wharf. There is a boat wharf in the narrow channel which encircles the central part of the town. About two miles below the town, on the left bank of the river, is a pier owned by the B.P.M.

Port Facilities

On the B.P.M. pier there is a crane with a lifting capacity of 10 tons. Coal and fuel oil are available at the main wharves. Small repairs can be carried out.

Trade and Industries

Bandjermasin has been a trading centre used by the Dutch since the early part of the seventeenth century. Its importance at the present day is derived from its proximity to the rubber plantation region on the western slopes of the Meratoes-geberge. Rubber and various kinds of forest products are the chief exports. In 1938, the foreign trade of the port totalled 52,974 tons, four-fifths of which were exports.

The industries at Bandjermasin are connected with the preparation

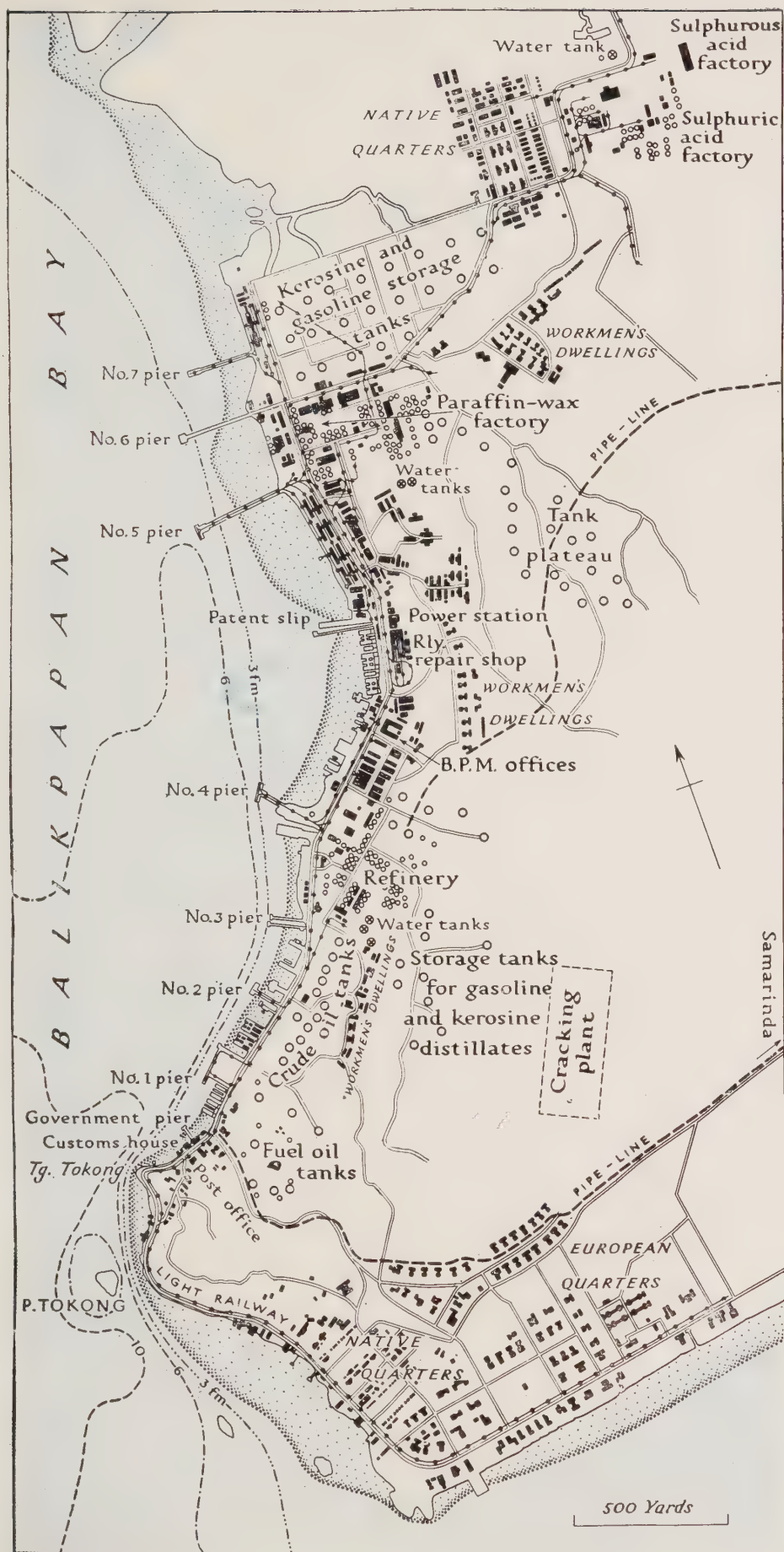


Fig. 95. Balikpapan

Source: (1) Admiralty Chart 3031 (1936, corrected to 1938); (2) Official sources.

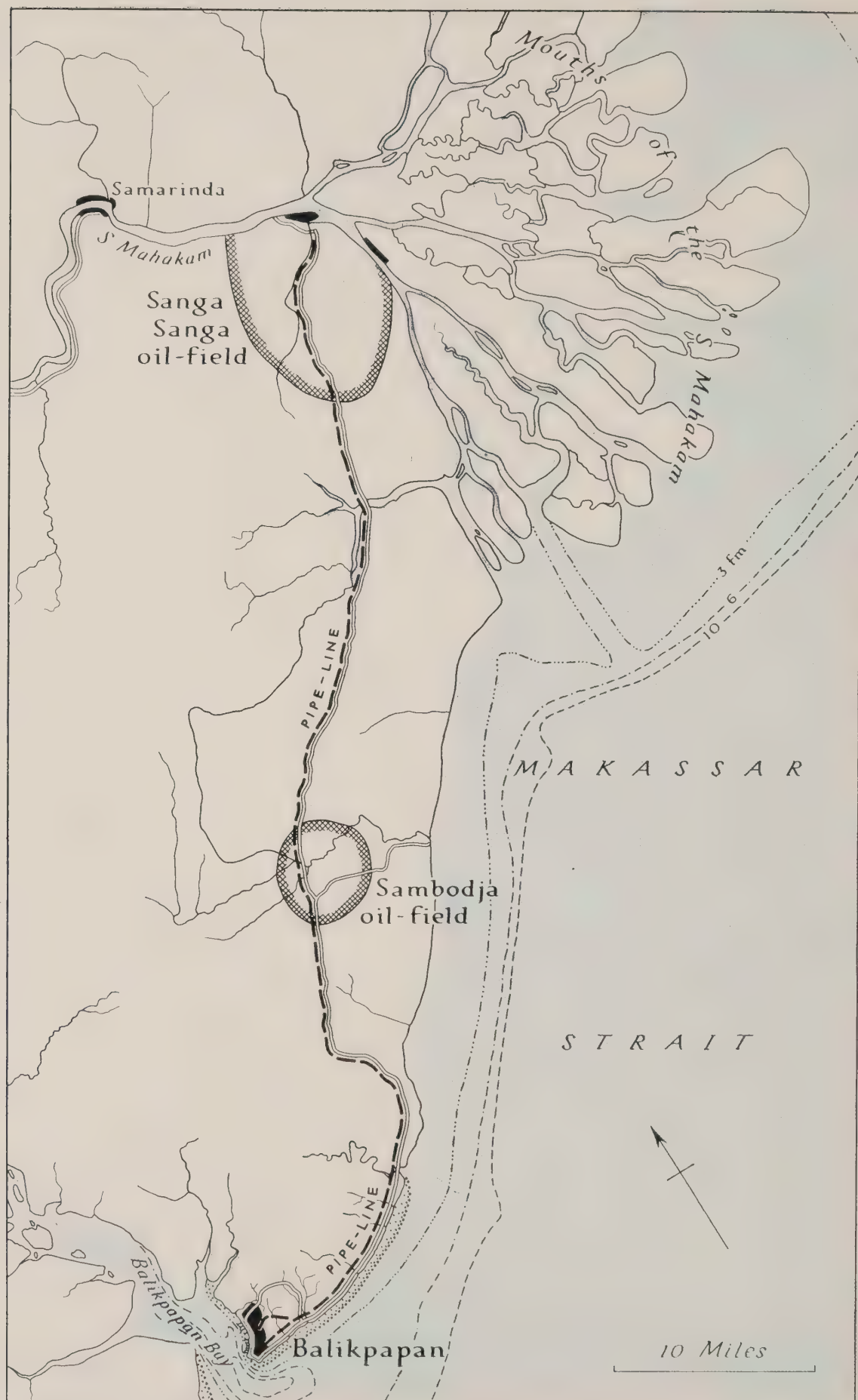


Fig. 96. Balikpapan: the oil fields

Source: (1) Admiralty Chart 2636 (1924, corrected to 1941); (2) Official sources.

of agricultural products for export. There are four factories for the treatment of rubber latex and three rice-husking mills.

Communications

Bandjermasin is linked by road with the small towns of Rantau and Amoentai in the centre of the plantation district to the north. At Oelin, fourteen miles south-east of the town, is a landing ground used by the K.N.I.L.M.

BALIKPAPAN

Lat. $1^{\circ} 16' S$, Long. $116^{\circ} 48' E$. Population, 29,843 (1930).

Admiralty Charts 3031, 2636. Figs. 95, 96. Plates 89-91.

Balikpapan lies at the entrance to a large inlet about fifty miles south of the Mahakam delta on the east coast of Borneo. It is one of the leading oil ports of the Netherlands Indies and has many factories for extraction of by-products from crude oil.

Approach and Access

The large inlet of Balikpapan bay, at the northern side of which the port has been built, is nearly six miles wide at its entrance and extends inland for about twelve miles. The country surrounding the bay is low and marshy, except at the northern entrance point where Tokong hill is a conspicuous landmark from the sea. Balikpapan is built on the lower slopes of this hill. In the entrance channel between the open sea and the port there is a least depth of 4 fm. at M.L.W.S., and 6 fm. at M.H.W.S. Within the bay, anchorage is available in a depth of 6 to 12 fm. over an area of four miles by one mile.

Detailed Description

The port extends along the shore of the bay for about two miles. There are eight piers, the southernmost of which belongs to the government; the rest are numbered from 1-7 inclusive. The length of the mooring berth at the head of each pier and the depth alongside is as follows:

	<i>Length at Head</i>	<i>Depth Alongside</i>
	ft.	ft.
Government Pier	54	4
No. 1 Pier	420	15
No. 2 Pier	120	10
No. 3 Pier	105	23
No. 4 Pier	180	25
No. 5 Pier	147	35
No. 6 Pier	90	27
No. 7 Pier	36	14

A number of mooring and warping buoys lie off the piers. The harbour master's office and customs house adjoin the government pier.

Port Facilities

Five cranes are available, one of 10 tons on No. 1 pier, one of 10 tons and one of 5 tons on No. 2 pier, and one of 1 ton and one of 10 tons on No. 5 pier. The last mentioned is a floating crane.

About 30,000 tons of fuel oil are normally in stock. Fuel oil is taken in from pipe-lines on the piers. The maximum rate of supply is from 400 to 500 tons per hour. Many storage tanks line the waterfront.

Repairs to vessels are carried out at a slipway belonging to the B.P.M. It is 117 ft. long, 23 ft. wide and has a lifting capacity of approximately 150 tons. Adjoining this slipway is a well-equipped iron and copper foundry and instrument shop.

The Town

Balikpapan is divided into two parts by Tokong hill; on the northern side are the works and offices of the B.P.M., and on the south-eastern side the European, Chinese and native quarters. Other native quarters are found in the extreme north of the town. The European residential district is called Glandesa. Water is brought to the town by pipe-line from the S. Seboi, fifteen miles away.

Trade

Balikpapan is the second port of the Netherlands Indies in tonnage of foreign trade. It holds this position on account of its enormous export of petroleum and petroleum products, in this respect resembling the port of Palembang in Sumatra. In 1938 almost the whole of its total exports of 1,768,102 tons was made up of fuel oil, kerosine, gasoline, lubricating oil, paraffin-wax and other petroleum products. The imports, which totalled 102,413 tons in 1938, comprise machinery and machine tools and a variety of other manufactured goods.

In tonnage of shipping Balikpapan is the ninth port in the Netherlands Indies. The number and tonnage of steamships calling at the port doubled between 1920 and 1938. In the latter year a total of 1,889,741 tons of shipping entered and cleared the port.

Industries

The oil industry of the *Bataafsche Petroleum Mij.* (B.P.M.) is centred at Balikpapan. Crude oil is conveyed to the refineries by pipe-lines from the fields at Sanga-Sanga and Sambodja north of the



Plate 89. Balikpapan

View looking north. No. 4 pier is in the left foreground.



Plate 90. Balikpapan: Sulphuric acid factory

The factory lies in the extreme north of the port, about a mile inland from No. 7 pier.



Plate 91. Sanga-Sanga oilfield, near Samarinda
Oil is piped from this field to the refinery at Balikpapan.



Plate 92. Makassar: Juliana Quay

port. The refineries lie close to piers No. 3 and 4; they have an output of 42,000 barrels a day. Further north is a factory for the manufacture of paraffin-wax and two factories where sulphuric and sulphurous acids are made. These acids are needed for the purification of kerosine. Nearby is an oil-drum and petrol-can factory using tin-plate imported mainly from England. A cracking-plant has recently been constructed south-east of the refineries.

Many storage tanks lie close to the refineries and processing plants. Crude oil is stored in tanks near the shore south of the refineries; fuel oil tanks lie east of the government pier and on what is called the 'Tank Plateau', south-east of the paraffin-wax factory. The main tanks for storing gasoline and kerosine are also found near this factory; the various distillates from gasoline and kerosine are stored in tanks close to the cracking-plant. The total capacity of the tanks is estimated at about 220,000 tons, of which 120,000 tons is fuel oil.

Communications

A light railway runs along the waterfront and links the industrial quarters with the European residential district. The waterfront is also skirted by a road which turns inland near the paraffin-wax factory and follows a roughly circular route to the main residential part of the town (Fig. 96). Another road follows the pipe-line to the Sambodja and Sanga-Sanga oilfields. About thirteen miles north-east of Balikpapan is a landing ground, used by the K.N.I.L.M.; there is a seaplane anchorage in Balikpapan bay.

LINGKAS (TARAKAN)

Lat. $3^{\circ} 17' N$, Long. $117^{\circ} 36' E$. Population, 11,589 (1930)

Admiralty Chart 3577. Fig. 97.

Lingkas is the port for the oil centre of Tarakan (Pamoesian) on the island of Tarakan off the mouth of the Soengai Sesajap in eastern Borneo. The port is built on the south-western shores of the island bordering Batagau strait. The main channel of approach lies between the southern point of Tarakan and the reef surrounding Poelau Meloeloen. The roadstead at Lingkas affords anchorage in a depth of about 11 fm. Two piers, with depths of $5\frac{1}{2}$ to 6 fm. at their head, extend from the shore and vessels can come alongside at all seasons; mooring buoys lie a short way off the piers.

A considerable supply of fuel oil is kept and oil can be taken in at either pier. Water is obtainable in moderate quantities. Minor repairs to ships can be carried out.

The foreign trade of Lingkas, like that of Balikpapan, is almost entirely confined to the export of petroleum, well over half a million tons being exported in 1938. The imports are insignificant.

The B.P.M. controls the production of oil for export, the main oil-field and pumping station lying at the town of Tarakan, two and a half miles inland from Lingkas. A subsidiary oilfield is being developed five or six miles north-west of the main field. At Tarakan, there are about fifteen tanks, a separating reservoir, and eight pumps worked by Diesel engines. A pipe-line conveys the oil to the port, where about twenty-five storage tanks, with a capacity of 160,000 tons, are available. There is a dehydration plant, but no refinery at Lingkas as the oil is of such quality there that, after water and sand has been removed, it is suitable for bunkering without further treatment.

A good road connects Lingkas with Tarakan. It runs alongside the oil pipe-line. There is a seaplane anchorage in the roadstead south of the port.

PORTS OF CELEBES AND THE MOLUCCAS

In Celebes, the Lesser Soenda islands and New Guinea, much of the local trade from island to island or from one part of the coast to another is carried on by native vessels which use the many small ports or anchorages found in this region. Only three ports in these various island groups, namely Makassar and Manado in Celebes, and Amboina in the Moluccas, are large enough to merit special treatment in this chapter.

MAKASSAR

Lat. $5^{\circ} 10' S$, Long. $119^{\circ} 32' E$. Population, 84,855 (1930)

Admiralty Chart 2662. Figs. 98, 99. Plates 92-94.

Makassar is situated on the west coast of the southern peninsula of Celebes. It is the capital of the island and an important distributing centre for products to and from the Moluccas and the Lesser Soenda islands.

Approach and Access

Makassar is usually approached from the south or south-west, and the course followed is either by way of Tanakeke strait, or by the channel between Poelau Dajangdajangan and Poelau Satanga. Three channels through the Spermonde archipelago north and west of the

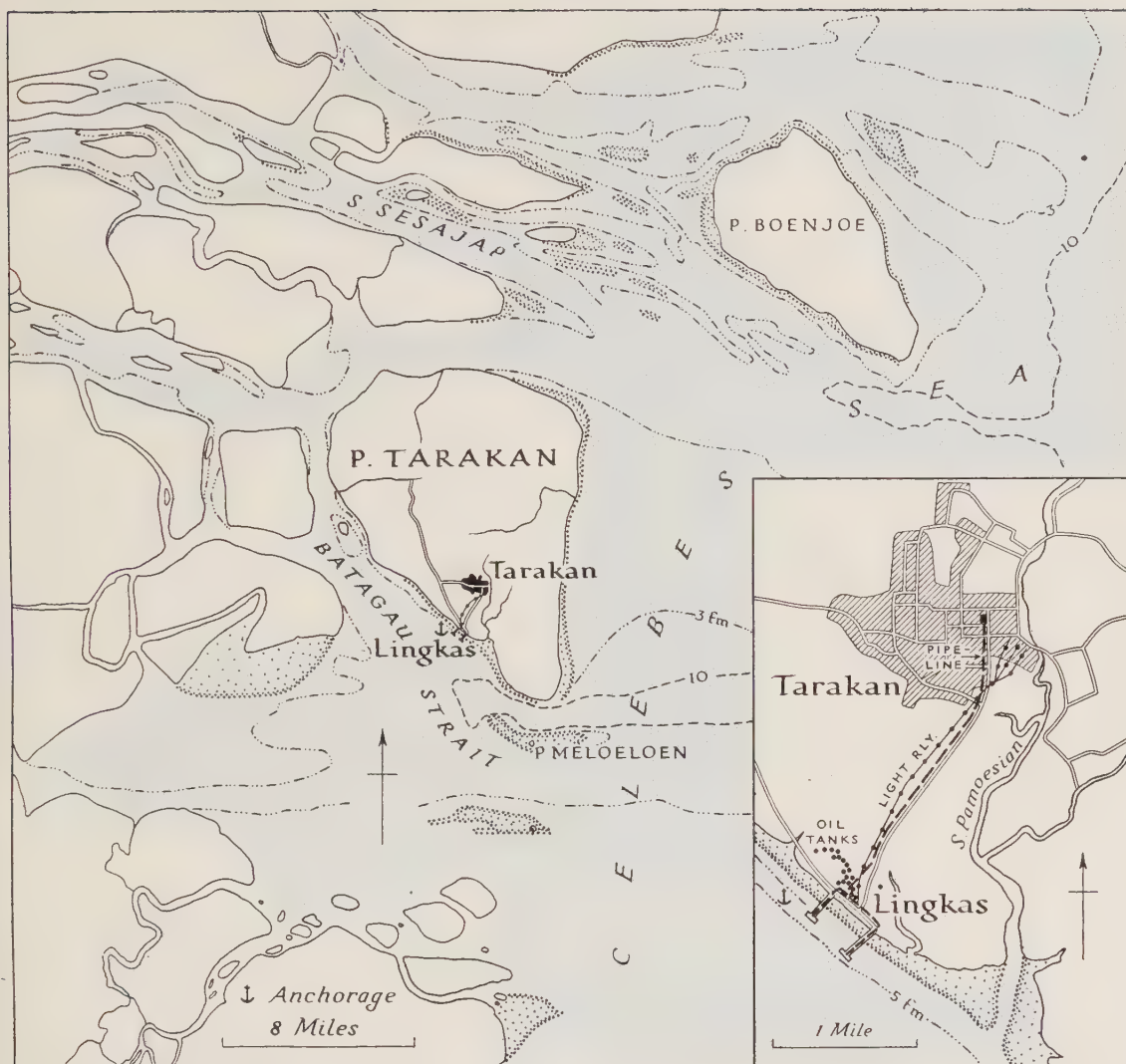


Fig. 97. Lingkas (Tarakan)

Source: (1) Admiralty Chart 3577 (1934, corrected to 1940); (2) Official sources.

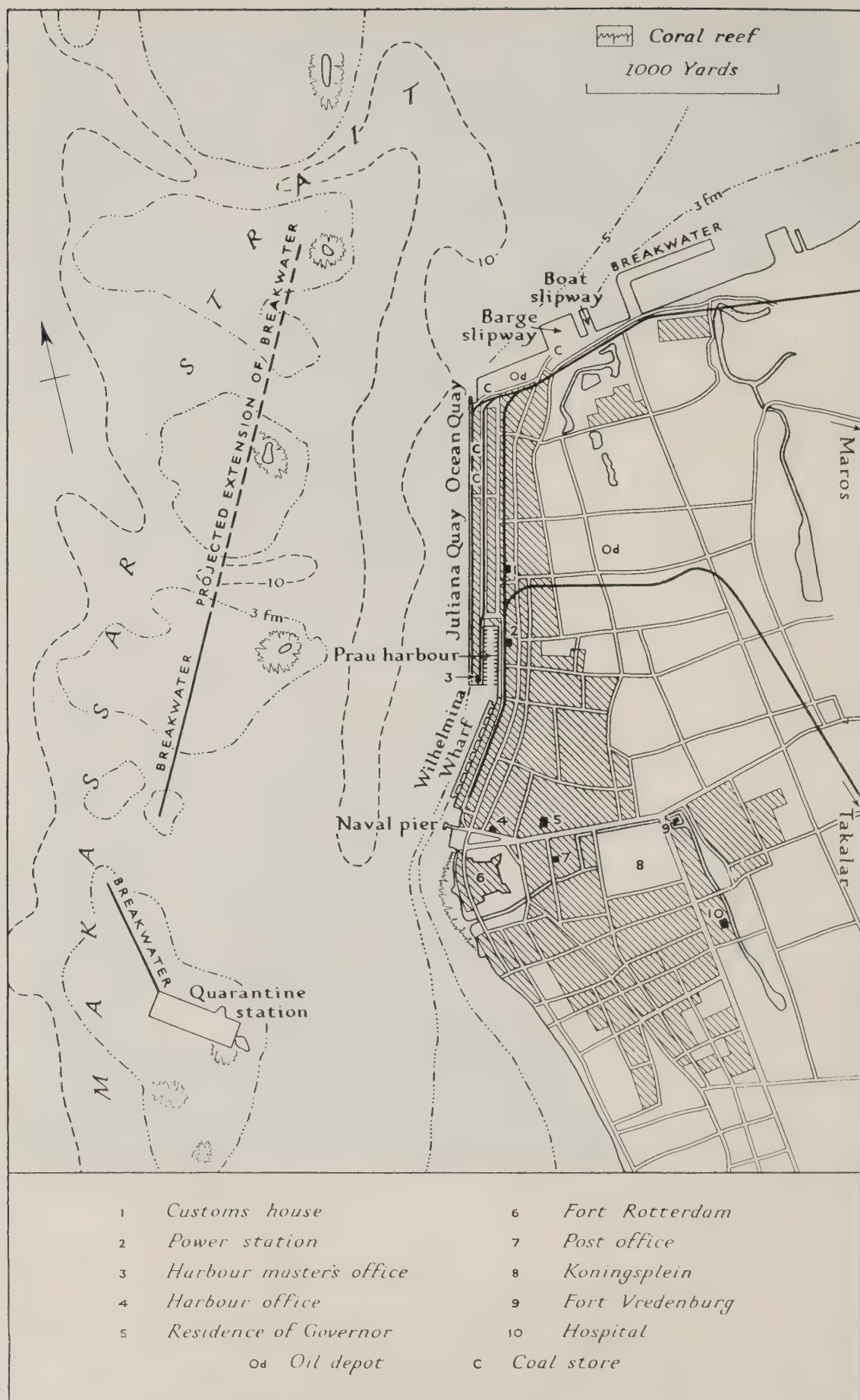


Fig. 98. The approaches to Makassar

The railway between Makassar and Takalar has been disused since 1930.
Source: Admiralty Chart 1293 (1898, corrected to 1939).

port are also used by shipping. The roadstead at Makassar is bounded by a line of coral reefs about half a mile from the shore, on which two breakwaters have been built. Anchorage is obtainable in depths of from 7 to 10 fm. The reefs and breakwaters only partially shelter the roadstead, and in the west monsoon season strong winds from the sea sometimes cause considerable swell.

The tides rise about 5 ft. Tidal currents in the roadstead are weak and have only a slight influence upon the monsoon drift.

Detailed Description

The port has two main quays for the accommodation of ocean-going vessels. Abreast the main part of the town is the Wilhelmina Wharf, 1,620 ft. long, with a depth alongside of 25 ft. at the south side and 20 ft. at the north end; it is offset about 30 ft. from the quayside, to which it is connected by nine gangways. Further north is the Juliana Quay, 4,560 ft. long, with a depth of 27 ft. alongside. This is the wharf chiefly used by the regular steamship lines; its northern end is known as Ocean Quay. On the inner side of its southern end is a small prau harbour. To the south of the Wilhelmina Wharf is a naval jetty, with a depth of 5 ft. alongside.

Port Facilities

The Juliana Quay is equipped with steam cranes each with a lifting capacity of $7\frac{1}{2}$ tons. There are no lifting appliances on the Wilhelmina Wharf.

Large warehouses line the waterfront and give ample accommodation for the storage of goods. A number of lighters, owned by the K.P.M., serve as harbour craft. Considerable supplies of coal are kept in stock and coaling is carried out at the rate of 50 to 60 tons an hour. Fuel oil and water can be taken in alongside the main wharves.

Small repairs can be carried out at three slipways, capable of hauling up ships of 90 tons, 75 tons and 25 tons, respectively. Two of these are owned by the K.P.M. and the other by the harbour board. The K.P.M. also own a well-equipped workshop. North of the town is a boat-building yard.

The Town

The town of Makassar is well laid out with many broad streets, shady avenues, and handsome public buildings. The old part of the town adjoins the waterfront near Fort Rotterdam and here are a number of Dutch houses in the old colonial style of architecture.

The main business and shopping centre lies inland from the Wilhelmina Wharf.

Makassar is the seat of the Governor of the Groote Oost, which territory includes Celebes, the Moluccas, New Guinea and many smaller islands east of Borneo, and is also the seat of the Resident of Celebes and Dependencies.

Trade

Makassar was opened to foreign trade in 1848 and its development as a port since then has been due chiefly to its natural harbour facilities and favourable position in the eastern part of the Netherlands Indies. It is not only the principal outlet for the products of Celebes, but is also the port of transhipment of goods from the Moluccas. Agricultural and forest products, especially copra, resin, coffee, maize, spices, ebony, shells and gums, form the bulk of the exports. The most important imports are cotton, woollen and silk goods. In 1938, the foreign trade of Makassar amounted to 354,775 tons, exports comprising 310,768 tons and imports 44,007 tons.

Between 1920 and 1938 the tonnage of ships calling at Makassar more than doubled. In the latter year, 2,424,800 tons of shipping entered and cleared the port. The number and tonnage of sailing ships visiting Makassar is greater than that of any other port in the Netherlands Indies, with the single exception of Soerabaja.

Communications

The Wilhelmina Wharf and Juliana Quay are served by a railway which connects with the now disused line to Takalar, on the coast some miles south of the town. Roads run from the town to all the main centres of population in the southern peninsula of Celebes. About ten miles east-north-east of Makassar there is a landing ground used by the K.N.I.L.M.

MANADO

Lat. $1^{\circ} 30' N$, Long. $124^{\circ} 50' E$. Population, 27,544 (1930).

Admiralty Chart 940. Fig. 100. Plate 95.

Manado, the capital of the Minahasa district, lies at the head of the bay of the same name near the eastern end of the northern peninsula of Celebes. Within the bay, which is eight miles wide at its entrance between Tg. Pisok and Tg. Kalasei, there are great depths up to a short distance from the shore; the bay is backed by mountains rising to over 6,000 ft. In the roadstead shipping is frequently endangered

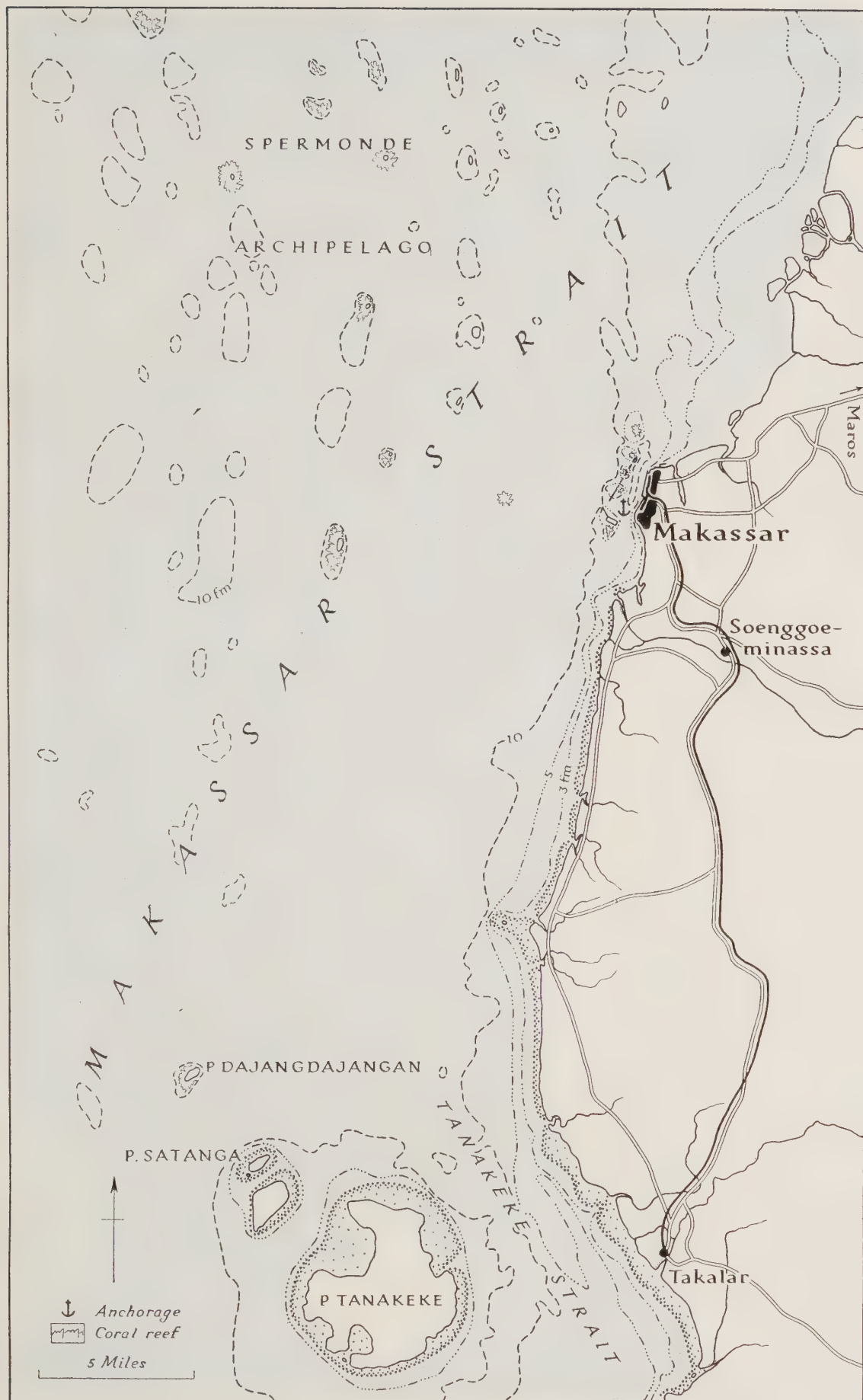


Fig. 99. Makassar

Source: (1) Admiralty Chart 2662 (1923, corrected to 1939); (2) Official sources.

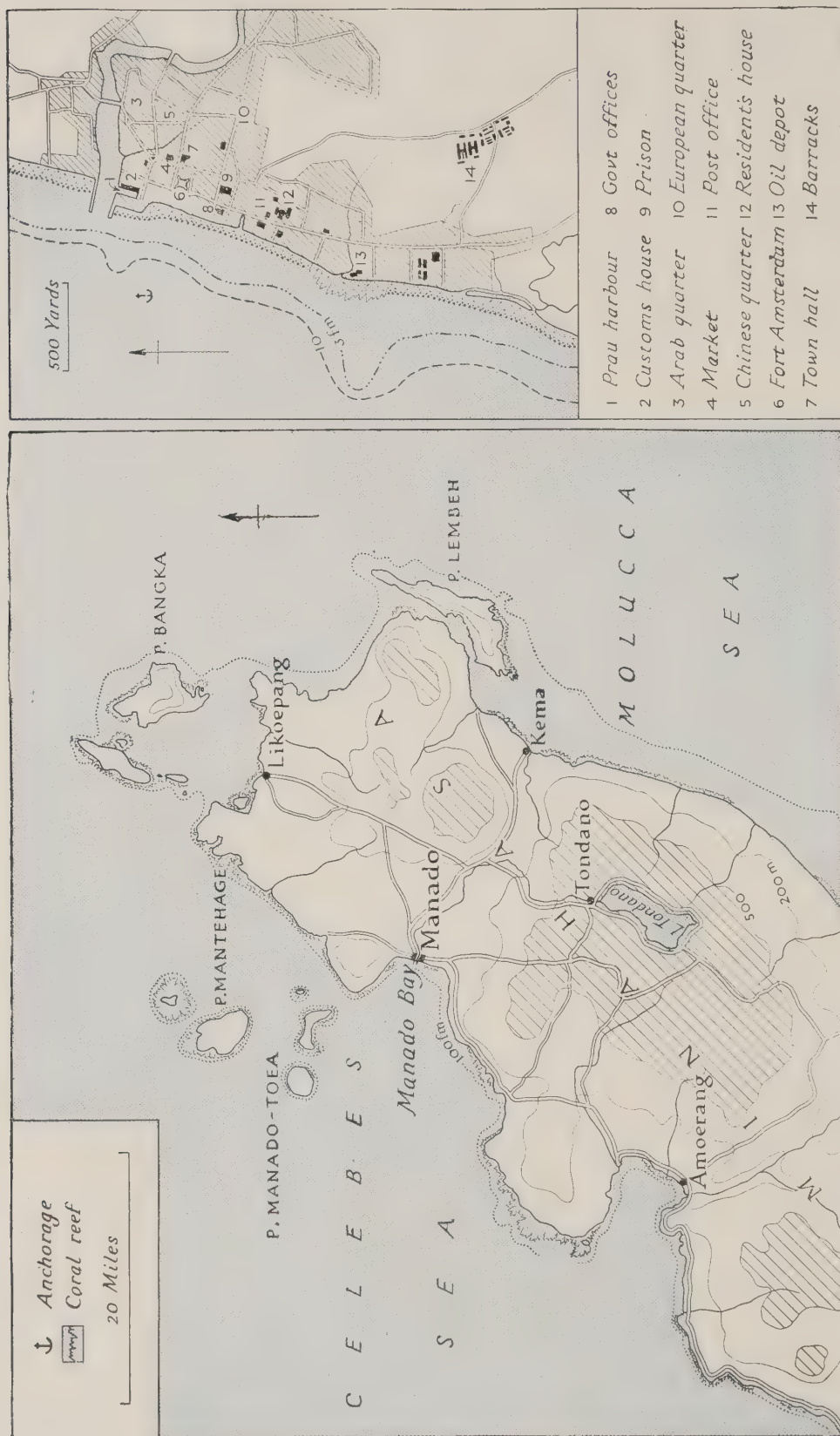


Fig. 100. Manado

Sources: (1) Admiralty Chart 940 (1925, corrected to 1930); (2) Official sources.

by heavy seas when squalls, called the *Barat*, blow from the north-west. Five mooring buoys are available for vessels anchored in the roadstead.

On the southern side of the mouth of the river, where the port and town of Manado is built, there is a prau basin, with a depth of 3 ft. Nearby is a landing place for boats in a depth of 2 ft. A mole extends from the northern entrance point of the river. Harbour craft includes twenty-four lighters of from 4 to 15 tons capacity.

Manado is the outlet for the fertile agricultural district of Minahasa. Its chief exports are copra and nutmeg. The port handled 42,342 tons of foreign trade in 1938.

Roads link Manado with all parts of the Minahasa district. There is a seaplane anchorage on lake Tondano about fifteen miles south of the port.

AMBOINA

Lat. $3^{\circ} 40' S$, Long. $128^{\circ} 14' E$. Population, 17,334 (1930)

Admiralty Chart 940. Fig. 101. Plate 96.

Amboina (Ambon) is the capital of the Residency of the same name and the chief port in the Moluccas. It is situated eight miles from the entrance to, and on the south-eastern shore of, Amboina bay in the island of Amboina.

Approach and Access

Amboina bay is some ten miles long and is five miles wide near its entrance between Tg. Noesanive and Tg. Alang, but narrows to form a narrow passage leading to an inner section, about 2 miles in width. On the eastern side of the bay about eight miles from Tg. Noesanive is the roadstead of Amboina, the approach to which is deep and clear of dangers. The roadstead affords anchorage for vessels not exceeding 245 ft. in length in a depth of about 25 fm. quite close to the shore. Depths of 40 to 50 fm. are found at a distance of 3 cables from the waterfront. The outer edge of the steep-to bank which fringes the shore is usually marked by fishing stakes.

The entrance to the inner part of Amboina bay, about a mile above the town, is rather more than a cable wide and has depths of from 5 to 10 fm. It then widens to about two miles, with depths varying from 12 to 19 fm. The head of the inner bay is separated from Bagoela bay on the eastern side of Amboina island by a low, narrow isthmus which joins the two peninsulas of Hitoe and Laitimor.

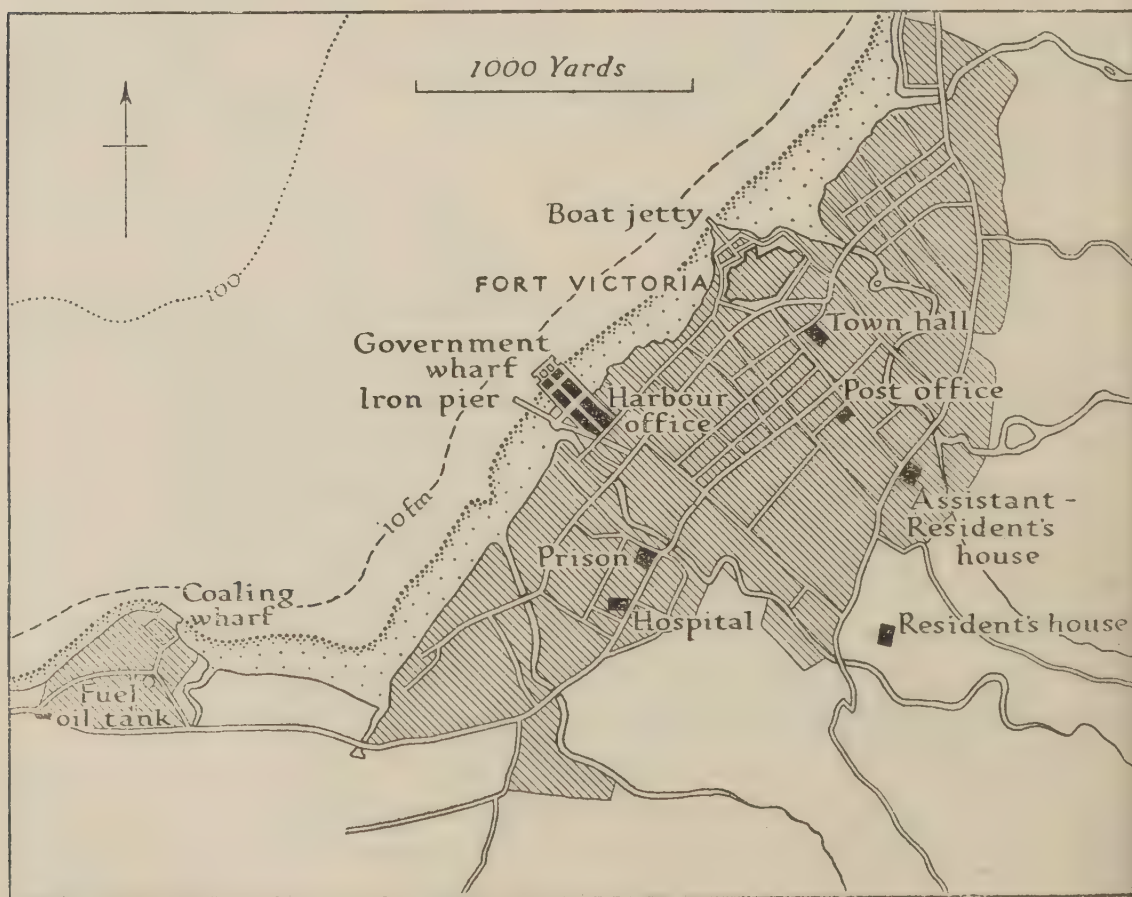
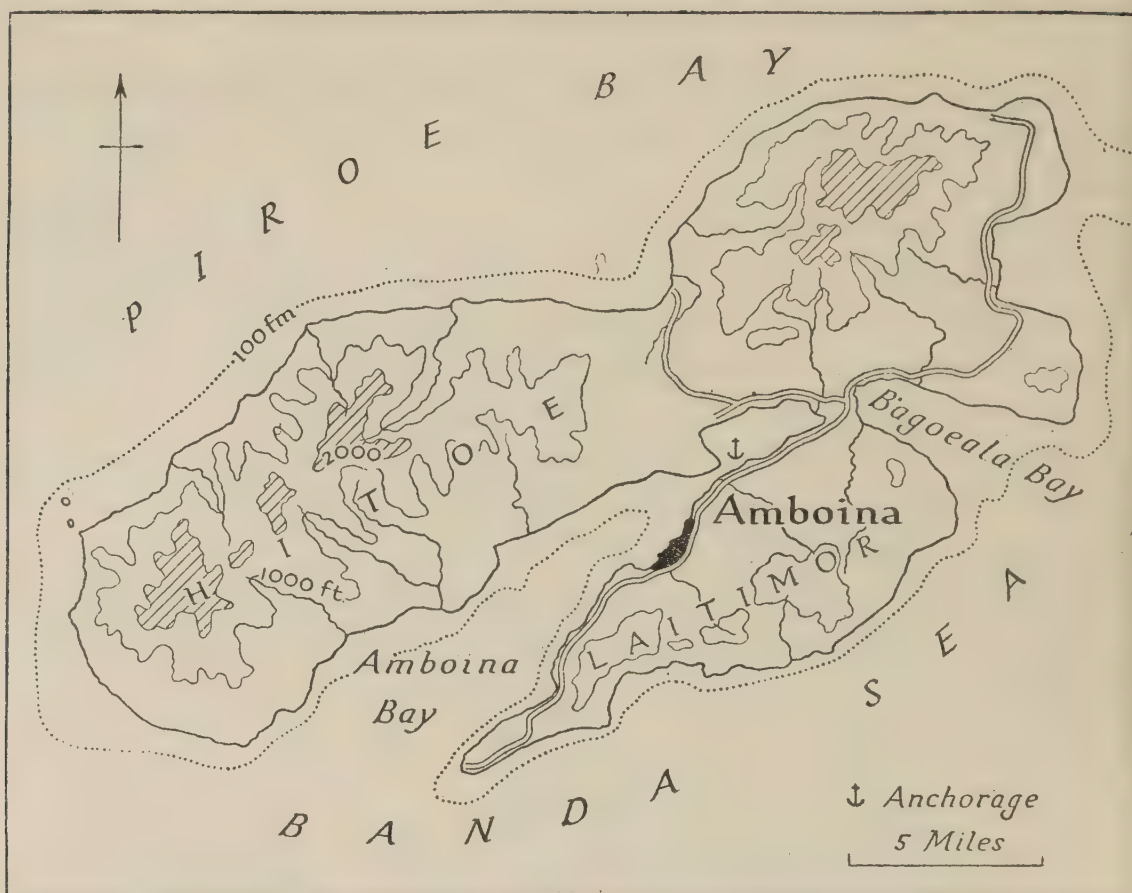


Fig. 101. Amboina

Source: (1) Admiralty Chart 930 (1930, corrected to 1936). (2) Official sources.



Plate 93. Makassar: entrance to the prau harbour



Plate 94. Street in Makassar



Plate 95. Manado

The photograph shows praus and other native craft near the mouth of the Manado river.



Plate 96. Amboina

Photograph taken looking north from the government wharf.

Detailed Description

Abreast the main part of the town is a concrete wharf, 312 ft. long with a depth of 33 ft. alongside. The wharf is offset 210 ft. from the shore to which it is connected by three gangways. Nearby to the south is an iron pier, in a partially collapsed state. Three-quarters of a mile south-west of the concrete wharf is a coaling wharf, with a length of 275 ft. and a depth alongside of 23 ft.; it is linked to the shore by two gangways. Near Fort Victoria at the northern end of the town is a boat jetty, with a depth of 5 ft. at its head.

Port Facilities

Coal and fuel oil are available, both being taken on at the coaling wharf. Coal is supplied in baskets at the rate of about 25 tons an hour. Water is laid on at the wharves. Cargo is stored in a number of warehouses alongside the concrete wharf. There is a privately-owned shipyard with a slipway where vessels up to 200 tons are repaired. Two workshops carry out repairs to government vessels.

The Town

Amboina is the largest town in the Netherlands Indies east of Makassar. It is well laid out with many government buildings and business premises. South-east of the main business centre is the Resident's house, in the centre of a fine park. In the north of the town is Fort Victoria, built by the Dutch in the early part of the seventeenth century.

Trade

As a trading centre Amboina was one of the earliest to be used by the Dutch in the East Indies. The trade of the northern Moluccas is now mainly centred on the port. Its chief exports are cloves, nutmeg, copra and various gums. The number of sailing ships far exceed the number of steamships calling at the port.

Communications

A road skirts the southern shore of Amboina bay and runs northwards to Waai on the east coast of the island. There is an airfield, used by the K.N.I.L.M., on the western shore of Amboina bay, and a seaplane station in the roadstead off the port.

BIBLIOGRAPHICAL NOTE

1. *Eastern Archipelago Pilot*, vol. I, 5th ed., 1935, with Supplement No. 6, 1943; vol. II, 5th ed., 1934, with Supplement No. 6, 1943; vol. III, 4th ed., 1943; vol. IV, 2nd ed., 1939, with Supplement No. 3, 1943.

Malacca Strait Pilot, 2nd ed., 1934, with Supplement No. 7, 1944.

China Sea Pilot, vol. II, 1st ed., 1936.

Pacific Islands Pilot, vol. I, 6th ed., 1933, with Supplement No. 8, 1943.

2. The best account in English is Wouter Cool, 'The Ports of the Dutch East Indies' *Dock and Harbour Authority*, vol. III, pp. 76-81, 86, 115, 120, 217-21, 253-56 (London, 1923). Shorter accounts are given in *Van Stockum's Travellers' Handbook for the Dutch East Indies* by S. A. Reitsma (The Hague, 1930) and in the *Handbook of the Netherlands East Indies* (Buitenzorg, 1930).

Chapter XIV

ROADS

Introduction: Roads of Java and Madoera: Roads of the Outer Provinces:
Road Traffic: Bibliographical Note

INTRODUCTION

In road development, as in population density and economic advancement, the difference between Java and Madoera and the Outer Provinces is most marked. In 1938, there were altogether 42,744 miles of roads in the Netherlands Indies, about 40% of which were in Java and Madoera. This concentration is due partly to the longer period of Dutch rule which Java has enjoyed compared with the other islands, some of which have only been pacified during the past half-century; partly to the more rapid economic development of Java which stimulated roadmaking; and partly to the availability of rivers as means of communication in many parts of the Outer Provinces, particularly in Sumatra and Borneo, which made the construction of roads less urgent or necessary. Moreover, the enormous and difficult task of clearing forests or jungle requires a large labour supply which is not readily available in the Outer Provinces, while financial difficulties create further problems. For these reasons, Java is still the only island in the Netherlands Indies with a well-developed road network, though certain parts of the Outer Provinces, such as the *cultuurgebied* and the Padang Highlands of Sumatra, the rubber plantation area of eastern Borneo, and the Makassar and Manado regions of Celebes, are well served by roads.

The condition of roads in the Netherlands Indies is on the whole good. Three-quarters of the roads are surfaced and suitable for motor traffic. Gravel is the most common material used for surfacing, but there are 7,339 miles of asphalt roads, most of which are found in Java. The upkeep of the roads is in the hands of the local authorities.

ROADS OF JAVA AND MADOERA

The construction of roads in Java dates from the beginning of last

century when the 'Great Post Road' was built under the direction of Governor-General Daendels between the years 1808 and 1811. This road, which extended from Anjeh on Soenda strait to Panaroekan near the eastern end of the island, was designed to facilitate the movement of troops in the event of enemy attack, which at this time seemed probable, and also to speed up the transport of agricultural products. There was a twice-weekly coach service from both ends of the route; the journey from east to west of Java took about six days, whereas before 1808, when the traveller had to follow rough tracks and narrow footpaths, the time taken was seldom less than six weeks. The completion of this highway in so short a time was a remarkable achievement and the 'Great Post Road' has formed the backbone of the present road system. During the course of the nineteenth century branch roads were built from it to the chief plantation areas and to the principal centres of population in the interior. The increase in the number of roads was especially rapid in the period of the Culture System from about 1830-1870, when there was compulsory cultivation of crops for the government and when good roads were needed to transport the produce quickly and easily to the ports. At the beginning of the present century a comprehensive road plan was worked out for the whole island and adopted in 1912 as the basis for all future extensions. This plan has been carried out so successfully that Java has to-day a first-class road system serving the greater part of the island.

In 1938, Java and Madoera had 16,641 miles of roads, over four-fifths of which were surfaced and suitable for motor traffic. Asphalt is used for metalling on 5,182 miles of roads, and on the rest of the surfaced roads gravel is commonly employed. The main highways are well graded and maintained in a good state of repair; responsibility for the upkeep of the roads devolves upon the provincial authorities. On most of the roads which carry a heavy traffic, especially those serving the more important plantation regions, the centre of the carriageway is used by motor cars and other light vehicles, while one side is occupied by a light estate railway and the other is reserved for all heavy vehicles. The roads are generally bordered by trees, brightly-coloured hedges of flowering shrubs, or bamboo trellis work, and form a not unattractive feature of the landscape.

Geographical Description

Two main trunk roads run the length of the island and these form the basis of the road network (Figs. 102, 103). The first follows a route



Fig. 102. The roads of western Java

B.	Batavia	P.	Palabochanratoe	S.	Soekaboemi	Tj.	Tjandjoer
Ba.	Bandoeng	Pa.	Pameungpeuk	Se.	Serang	Tj.	Tjilatjap
Ban.	Banjoemas	Pan.	Pandeglang	Si.	Sindangborang	Tj.	Wonosobo
Bu.	Buitenzorg	Pe.	Pekalongan	So.	Soebang	W.	
C.	Cheribon	Po.	Poerwakarta	Soe.	Soemedang		
G.	Garoet	Poe.	Poerwokerto	T.	Tegal		
In.	Indramajoe	R.	Rangkasbitoeang	Ta.	Tasikmalaja		
		Me.	Merak				

Source: *Atlas van Tropisch Nederland*, plates 20 and 21 (Batavia, 1938).

along the northern coastal plain, passing through Batavia, Cheribon and Tegal to Semarang, but east of this town it turns inland up the broad and low-lying Kali Loesi valley, crosses over the low watershed separating this valley from that of the lower Kali Solo, and then runs almost due east to Soerabaja. From here it continues by way of Pasoeroean, Probolinggo, and Sitoebendo to the eastern extremity of Java, where connection is made with the second of the two main highways.

The second of the two main highways of the island runs inland over almost the whole of its course from Laboehan on Soenda strait to Banjoewangi on Bali strait. The route is much more circuitous than that of the other highway, in view of the mountainous character of the interior of Java; the chain of volcanoes, which run the length of the island, compel long detours to be made, although, thanks to the lowness of the passes, the gradients are nowhere severe. From Laboehan the road passes through Rangkasbitoeng and then winds through hilly country to Buitenzorg; from here it runs round the great mountain mass of Goenoeng Pangrango to the upland basins of Bandoeng and Garoet. Shortly after leaving Garoet the road leaves the hilly country of western Java behind and enters the valley of the Tjitandoej, continuing along the southern coastal plain, south of Banjoemas, only to turn inland again to reach Jogjakarta and Soerakarta. East of Soerakarta the road branches: the northerly and more important branch follows the valleys of the K. Solo and K. Brantas to join the northern highway at Soerabaja; the other runs by a devious route between the volcanic masses and the thinly-peopled coastlands, passing through Wonogiri, Toeloengagoeng, Tempeh and Kalisat to Banjoewangi.

The two main longitudinal highways are linked by numerous branch roads, the most important of which run between the centres of population. Thus, to take only a few examples, Batavia is connected with Buitenzorg, Cheribon with Bandoeng, Tegal with Banjoemas and Semarang with Soerakarta. East of Soerakarta, the towns of Madioen and Kediri each lie on good roads, which provide communication between that part of the southern highway which follows the Solo and Brantas valleys and that part which runs through Wonogiri and Toeloengagoeng further south. Similarly, in the narrow eastern part of Java, each of the three main gaps between the volcanic masses carries a road; the chief towns which lie on these three transverse roads are Malang, Klakah and Bondowoso.

Apart from the two main trunk roads and their inter-connecting



Fig. 103. The roads of eastern Java

A. Ambarawa
B. Blitar
Ba. Banjoewangi
Ban. Bangkalan
Bl. Blora
Bon. Bondowoso
D. Diapara

J. Jogjakarta
Kl. Klakah
Ko. Koedoes
M. Malang
Mag. Magelang
Mo. Mojokerto
N. Ngawi

P. Pamekasan
Pa. Patitan
Pas. Paseroean
Po. Poerworedjo
Poe. Poerwodadi
Pon. Ponorogo
Pr. Probolinggo

R. Rembang
S. Soerabaja
Se. Semarang
Si. Sitoebendi
So. Soemenep
Soe. Soerakarta
T. Toeban

Tj. Tjepoe
W. Wonogiri
Wo. Wonosobo

Source: *Atlas van Tropisch Nederland*, plates 21 and 22 (Batavia, 1938).

branches, there are many other roads of considerable local importance. The complexity of the road network bears a close relation to the distribution of population and to the area of large-scale agricultural production. The network of subsidiary roads is most intricate and most highly developed along the northern coastal plain, especially near Cheribon and Tegal, in the upland basins of Bandoeng and Garoet, in the Banjoemas, Jogjakarta and Soerakarta regions and in the valleys of the lower Kali Solo and Kali Brantas. These areas are similarly the most densely peopled of any in Java. On the other hand, where the population is small and thinly scattered, as in western Bantam and along almost the whole southern coast, only a few roads have been built. The growth of sugar and other plantations has been a prime factor in the development of a road network on the plains of the north coast; this factor has also stimulated road making in the uplands of western Java and, more recently, in the extreme east of the island, near Bondowoso. The building of roads to serve the girdle of settlements, which reach high up the slopes of the volcanoes, is a feature of the local road pattern in the interior. This is well seen on the slopes of G. Slamet and G. Merapi in central Java. Some of these mountain roads communicate with health stations and sanatoria which have been established at high elevations in many parts of the island.

Madoera is served by a good road which runs round the island, passing through Kamal, Pamekasan, Soemenep, Ketapang-daja and Bangkalan. Two main highways link the north and the south coasts. There are relatively few other roads, except in the vicinity of Pamekasan and Soemenep.

ROADS IN THE OUTER PROVINCES

The density of a road network depends to a great extent on the density of population and, as already pointed out, there is a great difference between Java and the Outer Provinces in both respects. Java and Madoera have a population density more than thirty times as great as that of the Outer Provinces, but the road network is only ten times as dense. If the considerable stretches of navigable river in Sumatra and Borneo are also taken into account the disparity in communications is even less.

Sumatra has received more attention from the Dutch than any of the other islands except Java (Fig. 104). In the first place, this was due to its strategic position dominating the Soenda and Malacca



Plate 97. Semarang-Soerakarta road at Salatiga



Plate 98. Bridge over the Enim river near Moearaenim
This bridge carries the road from Palembang to Tebingtinggi.



Plate 99. Road near Barabai, south-east Borneo



Plate 100. Road crossing the Tjamba pass, southern Celebes

straits, and the continued resistance to Dutch authority on the part of its native rulers, particularly in Atjeh. This led to road building for military purposes and the existence of roads in turn encouraged the investment of capital in plantations, particularly in the Oostkust Residency around Medan. During the last fifty years the increasing importance of petroleum has led to a great development of roads around the oilfields in Djambi and Palembang and further north in the neighbourhood of Pangkalanbrandan. Since 1934, the money obtained from the export duty on rubber has been devoted to road construction in the rubber-growing areas of Sumatra and Borneo. Elsewhere, development has been slower owing to the high cost of road construction and to the limited funds available.

The length in miles of roads in the Outer Provinces in 1938 was as follows:

<i>Asphalted</i>	<i>Surfaced</i>	<i>Not Surfaced</i>	<i>Total</i>
2,157	16,517	7,430	26,104

The asphalt roads are found chiefly in the vicinity of the towns. Stone or gravel is used in surfacing the other main roads. New roads are built with an earth crown about 7 yd. wide in flat country and 5 yd. wide in hilly country, and a 3 yd. band is given a thin surfacing. If traffic increases a heavier surfacing is given and the band may be increased to a width of about 5 yd. This method enables the greatest number of roads suitable for wheeled traffic to be constructed for a given capital investment. A maximum gradient of 1 : 15, and curves of a radius of at least 110 yd., have been adopted as a minimum standard, though there are still many roads which do not fulfil these requirements, particularly on the steep western slopes of the Barisan range in Sumatra.

Sumatra

The road network in Sumatra is by no means complete, though the deficiencies are to some extent compensated by long navigable stretches on many of the rivers flowing through the swampy country which extends far inland from much of the east coast. The roads in this area run for the most part from the town at the head of navigation on one river to the similar town on another, avoiding the swamps. Only rarely are navigable rivers paralleled by roads. Apart from these east coast swamps, Atjeh is the area with fewest roads. Road building here was begun for military purposes during the Atjeh war at the end of the nineteenth century and little new construction has been undertaken in recent years.



Fig. 104. The roads of Sumatra

Source: *Atlas van Tropisch Nederland*, plates 12, 13 and 14 (Batavia, 1938).

Probably the most important main road in Sumatra is that which runs the length of the island from Oosthaven in the south to Koetaradja in the north, a distance of 1,659 miles. The last link in this great through-road was completed by the opening of a bridge over the Air Komering at Martapoera in 1938. From Oosthaven northwards, as far as the neighbourhood of Sawahloento, the road follows the gentle eastern slopes of the Barisan range. Here, it turns westward to Solok and then runs northward again beside lake Singkarak to Padangpandjang. It then climbs to over 3,000 ft. in the Batak plateau between Goenoeng Singgalang and G. Marapi and descends to Fort de Kock. North of Fort de Kock the road follows the valleys of several rivers draining to the west coast, but here running roughly north and south with watersheds seldom exceeding 1,000 ft. between them. Beyond Taroetoeng, altitudes of 3,000 ft. are again reached as the road approaches lake Toba, part of the southern and eastern shores of which it skirts. From Panaka a north-easterly course is followed through Pematangsiantar to Tebingtinggi. From this point the road runs through Medan and Langsa to Sigli, keeping to the eastern coastal plain. At Beutong, north of Sigli, it turns inland round the southern side of Goudberg and then follows the valley of the Kroeëng Atjeh to Koetaradja.

This trunk road provides connections between the majority of the larger towns in Sumatra, though most of them lie on branches, rather than on the main road. Among the more important of these branches are those to Palembang, Djambi, Benkoelen and Padang. Branches run from Martapoera and Batoeradja to Palembang, the latter being the better as it follows the west bank of the Air Ogan and avoids the swamps which lie to the east of this river. Another road from Palembang joins the trunk road at Moearaenim and between this and the Batoeradja-Palembang road there is a fairly well-developed network (Plate 98). From Tebingtinggi and Loeboeklinggan branches run westward to a lateral road running roughly parallel to the trunk road; a branch connects this road with Benkoelen, the junction being at Kepahiang. From Benkoelen a road runs southward along the coast to Balimbing, though in its southern portion it is little more than a track. Another road runs northwards, also following the coast, to Padang and beyond.

A branch from the trunk road at Moearatebo follows the Batang Hari as far as Moearaboelian and then makes a detour to the south to join the direct road from Palembang to Djambi.

A short road from Padang to Solok and a longer one via Loeboek-

aloeng to Padangpandjang connect the trunk road with the largest town on the west coast. The direct road from Palembang to Djambi was built by the *Nederlandsch-Indië Aardolie Mij.* for the construction of a pipe-line; it is unsurfaced and serves for limited motor traffic. The construction of this road reduced the length of the journey from Djambi to Palembang by over 400 miles. It is intended to make the road passable for motor buses and lorries by adding a light surfacing and replacing a few ferries by bridges.

In the *cultuurgebied* around Medan there is a considerable network of roads linking up the large estates with the railway and the east coast ports. In northern Atjeh, with the exception of a single good branch road from Bireuen to Takingeun, there is nothing but tracks and a few secondary roads. On the west coast of Atjeh there is only one road of more than local significance. This runs from Meulaboh southwards through Tapaktoean to Roending, at the head of navigation on the Simpangkiri, and thus provides communication with Nieuw Singkil.

Bangka and Billiton

Bangka and Billiton, owing to the importance of their tin mines, are both relatively well supplied with roads.

On Bangka a main road runs from Muntok to Pangkalpinang, where it is joined by a road from Belinjoe, and then southwards to Toboali with a branch to Koba. Billiton is particularly well supplied with roads which connect all the larger settlements. The chief of them runs from Tandjoengpandan to Manggar via Pasarbaroe and Boeding, continuing from Manggar by way of Dendang and Banten back to Tandjoengpandan. There is also a main road direct from Tandjoengpandan to Manggar.

Islands off the west coast of Sumatra

The islands off the west coast of Sumatra have few tracks and no roads, with the exception of Nias. Here, there is a road which runs round the island close to the coast. There is in addition a road crossing the island to the north of Goenoeng Lelematsjoea.

Borneo

There is no general road system in Borneo, though there are local networks near Pontianak and Bandjermasin, and other isolated roads near Balikpapan on the east coast and Soekadana on the west coast. Elsewhere, the long stretches of navigable river are supplemented by forest tracks, for the most part suitable only for foot passengers (Fig. 105).

From Pontianak a road runs northward along the coast to Singkawang, then inland to Sambas, beyond which it returns to the coast,



Fig. 105. The roads of Borneo

Source: *Atlas van Tropisch Nederland*, plate 25 (Batavia, 1938).

ending just short of the Sarawak boundary. Another road runs inland from this coastal road, which it joins south of Mampanah, to Sanggau on the Soengai Kapoeas. There are a few other lesser roads and a considerable network of tracks in this area. The only other stretch of road in western Borneo runs along the coast from the Soengai Lida, which forms the southern boundary of the Kapoeas delta, to Ketapang and Kendawangan, a distance of about 150 miles.

From Bandjermasin a road network extends along the eastern side of the Soengai Barito as far as Boentok, connecting Kandangan and Amoentai with these places and stretching eastwards to the foothills of the Meratoes-gebergte. This network serves the numerous rubber plantations in the district (Plate 99). Tracks connect this system with the road from Tenggarong to Samarinda and Balikpapan.

Celebes

In Celebes there are two road networks, in the Makassar and Manado regions, the only developed regions in the island, and a number of more or less isolated stretches of road notably in the neighbourhood of Donggala and Kendari and on Poelau Moena.

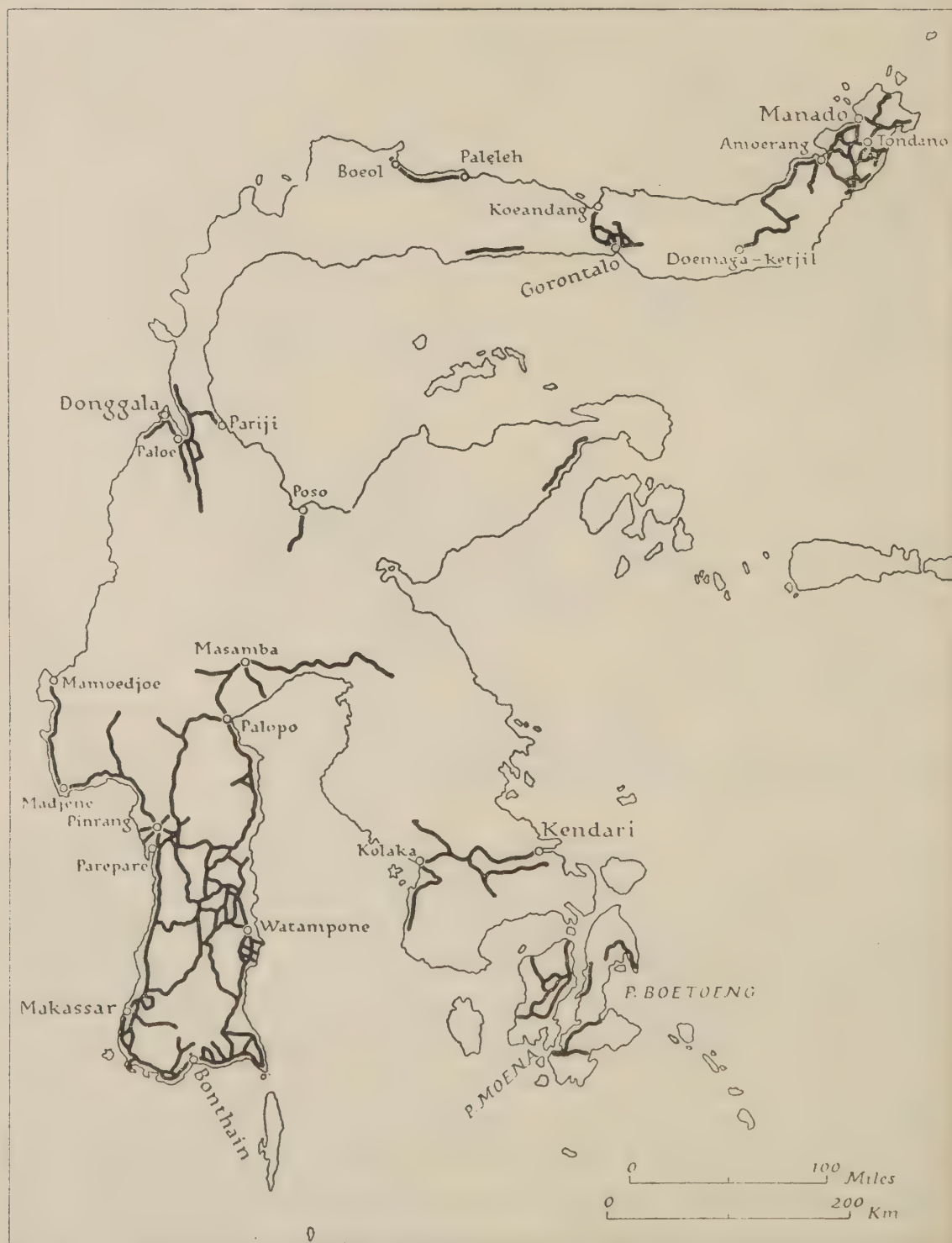


Fig. 106. The roads of Celebes

Source: *Atlas van Tropisch Nederland*, plate 26 (Batavia, 1938).

From Makassar a main road follows the coastal plain to Parepare and then crosses the southern peninsula by way of the valley of the Soengai Sadang to Makale and Palopo. From Palopo it continues round the head of the gulf of Boni to Tiinampoeoe in the vicinity of lake Towoeti. Another road follows the coast south from Palopo to Watampone and on round the southern end of the peninsula through Bonthain and back to Makassar (Plate 100).

In the Manado region there is a fairly dense network round Manado, Amoerang and lake Tondano. A road runs westward to Doemaga-ketjil and, with the building of another 50 miles, would provide through communication by land with Gorontalo.

A road follows the narrow coastal plain round Paloe bay connecting Paloe and Donggala. From the former place a branch runs southward up the valley of the Soengai Paloe and connects, by means of a track, with the Makassar road system at Masamba.

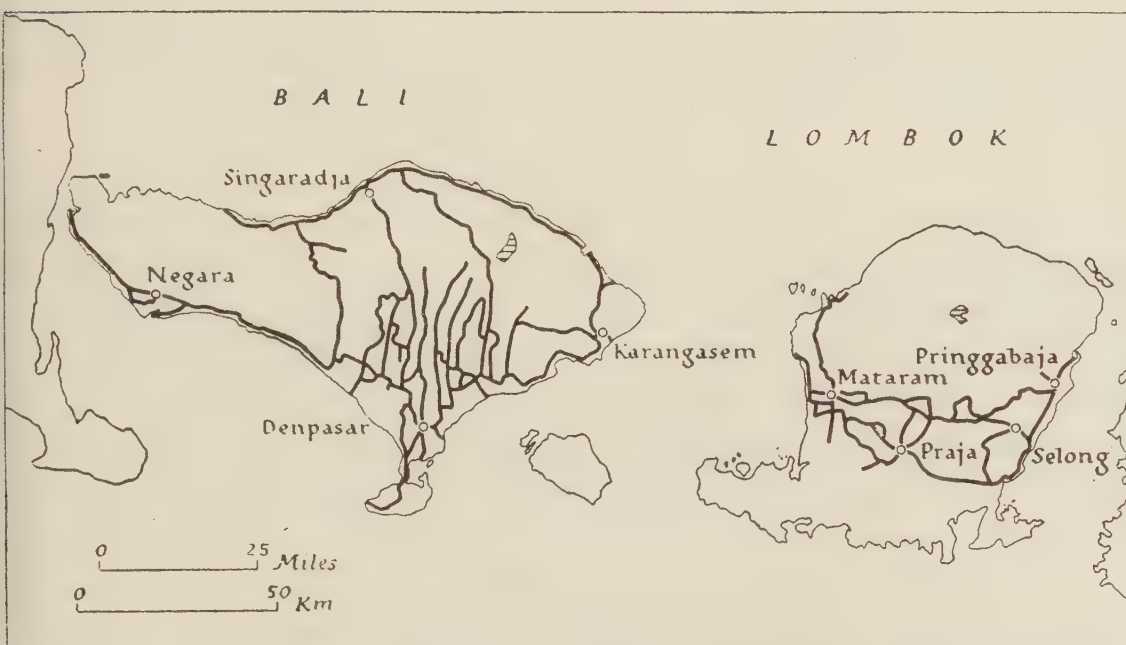


Fig. 107. The roads of Bali and Lombok

Source: *Atlas van Tropisch Nederland*, plate 22 (Batavia, 1938).

Lesser Soenda islands

Bali and Lombok have the best road systems in the Lesser Soenda islands, the roads of Bali being particularly good (see Figs. 95 and 99 in vol. I of this Handbook). Of the other islands, Soemba, Soembawa, Flores and Timor have roads which run the length of the islands connecting the chief settlements (Figs. 107, 108).

The Moluccas and New Guinea

Amboina has a good coastal road near the town of Amboina, but elsewhere in the Moluccas and New Guinea there are no through-roads and only a few short stretches of road in the neighbourhood of ports and larger settlements.



Fig. 108. The roads of the Lesser Soenda islands (excluding Bali and Lombok)
Source: *Atlas van Tropisch Nederland*, plate 27 (Batavia, 1938).

ROAD TRAFFIC

Road transport is well developed in Java and Madoera, but to a lesser extent in the Outer Provinces. The total number of motor vehicles in the Netherlands Indies increased from 61,850 in 1935 to 82,382 in 1938. In the latter year over two-thirds of the vehicles were in Java and Madoera. Private cars, motor buses and motor lorries are the chief types of vehicles in use. Motor services are operated by private concerns and, though a very much smaller number, by the railway companies. The operation of a bus or lorry service is subject to the issue of a licence by the local authorities. The development of road transport services has to some extent deprived the railways of their passenger and parcels traffic; in many parts, however, the road and railway services are complementary.

In 1938 there were 53,792 motor vehicles in Java and Madoera, divided into five classes as shown in the following table:

	No.
Private cars	34,979
Motor buses	1,778
Motor lorries	6,085
Three-wheelers	1,546
Motor cycles	9,404
	<u>53,792</u>

Source: *Indisch Verslag*, 1938, vol. II, p. 401 (Batavia, 1938).

The volume of motor traffic is fairly heavy in and around the towns, but elsewhere it is not large. Motor buses ply on all the main highways and are widely used by all classes of the population. The buses are maintained chiefly by large private concerns, but a small number are run by the railway companies. Most of the motor lorries are used to transport plantation-grown produce to the principal towns and ports. The three-wheeled vehicles mentioned in the table are a new form of cheap taxi found mainly in Soerabaja, Malang and other towns of eastern Java.

The following table gives the numbers of the various types of motor vehicles in the various parts of the Outer Provinces in 1938:

	Private cars	Motor buses	Motor lorries	Three-wheelers	Motor cycles	Total
Sumatra	8,839	5,754	4,414	145	1,745	20,897
Borneo	1,839	138	467	53	567	3,064
Celebes	1,144	857	296	46	610	2,953
Lesser Soenda islands	755	339	233	—	167	1,494
Moluccas and New Guinea	86	33	29	10	24	182
Total	12,663	7,121	5,439	254	3,113	28,590

Source: *Indisch Verslag*, 1938, vol. II, p. 401 (Batavia, 1938).

These figures indicate clearly the nature of the traffic in the islands and the importance of bus services in Sumatra and Celebes. Although the density of roads and the number of motor vehicles is much less in the Outer Provinces than in Java and Madoera their importance is great, owing to the imperfection of the railway network in Sumatra and to the absence of railways elsewhere.

BIBLIOGRAPHICAL NOTE

1. Information on the roads of the Netherlands Indies is given in S. A. Reitsma, *Van Stockum's Travellers' Handbook for the Dutch East Indies* (The Hague, 1930).
2. There is an interesting description of the 'Great Post Road' of Java in H. W. Ponder, *Javanese Panorama* (London, 1942).
3. The development of motor traffic is briefly dealt with in Paul Wohl and A. Albitreccia, *Road and Rail in Forty Countries* (Oxford, 1935).

Chapter XV

RAILWAYS

Introduction: History of Development: State and Company Lines:
Railways in Java: Railways in Sumatra: Bibliographical Note

INTRODUCTION

There are about 4,600 miles of railways in the Netherlands Indies, divided unequally between Java and Sumatra. The following table presents a statistical comparison between these railways and those of the mother country and of the neighbouring territory of British Malaya.

	Area thous. sq. miles	Population (millions)	Railways (miles)	Area per mile of rly.	Population per mile of rly.
Java and Madoera Sumatra	51 182	41·7 8·2	3,362 1,227	15 149	12,381 6,721
British Malaya	51	5·2	1,067	47	4,859
Netherlands	13·5	8·7	2,072	6	4,202

Java has a network of lines covering the whole island and attaining a density comparable with that of European countries, though there are several different gauges and many of the lines are simply steam-tramways. In Sumatra there are three distinct systems; Madoera has one single line. For a period there was a short line in the Makassar district of Celebes, but it was abandoned in 1930. Elsewhere in the larger islands of the archipelago, economic development is mainly coastal, and such developed areas, together with the smaller islands, are served by coastwise and inter-island shipping lines (see Chapter XVI).

The railways comprise State and company lines. The former, with nearly 60% of the route mileage, are the more important. Their object has been to provide inter-communication between the major inland towns and ports of Java, and to open up remoter districts in both Java and Sumatra. The company lines have been built for the most part to connect producing areas with their respective trade centres and ports.

HISTORY OF DEVELOPMENT

Java

The construction of railways in the Netherlands Indies began during the Liberal movement in the second half of the nineteenth century. Plans were begun as far back as 1840, but divided opinion on the problem of private or State control delayed the commencement of construction for over twenty years. Then in 1862 a concession was granted to a company—the Netherlands Indies Railway Company (*Nederlandsch-Indische Spoorweg*—N.I.S.) for a line of 162 miles from Semarang to the Native States (*Vorstenlanden*). Construction of this standard-gauge line began in 1864, and in the same year another concession was granted to the N.I.S. for a medium-gauge line between Batavia and Buitenzorg. Progress was not rapid, partly no doubt owing to the unusual nature of the terrain and of the climatic conditions (there were very few, if indeed any railways in the equatorial belt at this period). Both lines were completed in 1873, by which time the planters in many areas were clamouring for railways, though they were reluctant to invest money in them. Under the circumstances the government decided to enter the field, and in 1875 a bill was passed authorising the inclusion in the budget of a sum of f 1 million for the building of State railways. Attention was first directed to the sugar district of eastern Java, and in 1879 a line was opened on 3 ft. 6 in. gauge, from Soerabaja to Malang, with a branch to Pasoeroean.

Thenceforward State and private enterprise proceeded apace, with fluctuations in the rate of progress resulting from the general financial and economic circumstances. The State programme was advanced for defence purposes and to open up distant parts of the country for economic development. Private enterprise for the most part concentrated on subsidiary lines and on light railways serving plantations.

In 1881 the first 'steam-tramway' company was founded, providing an example which was ultimately followed in many other districts. Its line of 54 miles from Semarang to Djoewana, across the base of the Moerjo peninsula, linked four large sugar factories to the terminal ports. Constructed on 3 ft. 6 in. gauge, it was, like many of its successors, a light or local railway rather than a tramway, but the name 'stoomtram' has been adopted for all such lines, many of which run along the roads, just like the *chemins de fer vicinaux* of Belgium and the Netherlands. The Semarang–Cheribon line, begun in 1895, is a further example, for although called a 'steam-tramway', it is a main

line of communication along the northern coastal plain of central Java, and carries 'express' trains at over 37 m.p.h.

The first long-distance through-route was opened in 1894, from Batavia via Buitenzorg—Bandoeng—Maos—Jogjakarta—Soerakarta (Solo) to Soerabaja. The Jogjakarta—Soerakarta (Solo) section of this route was part of the Netherlands Indies company's standard-gauge (4 ft. 8½ in.) line, and the delay caused by the transfer of traffic to and from the State medium-gauge (3ft. 6 in.) lines was not remedied until 1899 when a third rail was added. Only through goods traffic passed over this mixed gauge line at first, however, and it was not until 1906 that passenger traffic commenced.

By 1900 then, there were 1,851 miles of railway in Java, of which 1,026 miles belonged to the State, and 825 miles to companies. The rapid growth of prosperity during the new century gave a fresh impulse to railway building. Some 310 miles were added to the State network before the war of 1914–18, including the Krawang–Padalarang line, which reduced appreciably the distance between Batavia and Bandoeng. The Batavia–Buitenzorg line of the N.I.S. was taken over by the State in 1913. There was an even more rapid development of the 'steam-tramways', the majority of which acted as feeders to the State lines. A second through-route between Batavia and Soerabaja, over the Cheribon–Semarang 'steam-tram' line and the Semarang–Soerabaja line of the N.I.S., became available in 1912. This had the advantages of uniform 3 ft. 6 in. gauge throughout and of very easy gradients along the northern plain but the disadvantages of tripartite ownership and inferior construction to the southern route.

The war of 1914–18 put a brake on new construction, but one very important line was completed in 1917. This ran from Cheribon to Kroja junction, across the 'waist' of Java; it subsequently became part of the main line between Batavia and Soerabaja. From 1920 there was renewed progress, both in building and in reconstruction. Electrification in the Batavia area began in the early twenties, and the fiftieth anniversary of the State railways, in 1925, was an appropriate occasion for the opening of the electrified line from Tandjoengpriok to Meester Cornelis; electric traction was later extended to Buitenzorg (Plate 101). At Soerabaja, traffic delays caused by the goods line running through the town at street level were eliminated by the construction of a long viaduct, opened in 1926, from Sidotopo to Kalimas. On the main Batavia–Soerabaja route, the inconvenience of the mixed gauge section between Jogjakarta and Solo was

remedied in 1929 through the construction by the N.I.S. of a separate 3 ft. 6 in. track alongside the standard-gauge track.

The State railways were made over to the Public Works Department in 1906, to be transferred three years later to the newly constituted Department of State Enterprise. When the latter was abolished in 1934, they fell to the Department of Communications and Public Works.

Sumatra

In Sumatra the first impulse to railway building was the war in Atjeh. After the pacification of the area, General van Heutsz began in 1894 to replace his main coastal road by a light railway, some 300 miles in length, running from Koetaradja via Sigli and Langsa to the shores of Aroe bay. This line had no economic significance at that time, however, and it was left to private enterprise to develop the first real railway in Sumatra, the Deli Railway. The Deli Tobacco Company obtained a concession in 1883 for a line to serve this prosperous and rapidly expanding plantation area; the first section from Belawan to Medan was opened in 1886, and the system subsequently extended along the coastal plain in both directions and with branches inland, reaching a total length of over 330 miles.

State enterprise entered the field again in 1887, this time for economic reasons. A line was constructed to penetrate the Barisan range from the port of Padang to the State-owned coal mines at Sawahloento in the Oembilin basin.

In southern Sumatra two separate State lines were begun, which eventually joined. One ran inland from the river port of Palembang to the coal and oil fields of the Lahat region and the Lematang valley. The second, begun in 1912, ran from the new port of Oosthaven, built to replace Teloekebetoeng, inland across virgin country, eventually joining the former line at Batoeradja in 1927. This was definitely a pioneer line, for the country was sparsely peopled, and Javanese labour had to be imported.

Celebes

A short State line, 29 miles in length, was opened in 1922, running from Makassar to Takalar, but it proved uneconomic and was abandoned in 1930.

STATE AND COMPANY LINES

The following table summarizes the relation between State and

company route-mileage in the three islands. The figures relate to the year 1940.

Area	Gauge ft. in.	State Railways (miles)	Company Railways (miles)	All Railways (miles)
Java	4 8½	—	162	162
Java	3 6	1,771	1,247	3,018
Java	1 11½	49	—	49
Madoera	2 6	—	139	139
Sumatra (South)	3 6	401	—	401
Sumatra (West)	3 6	164	—	164
Sumatra (North)	2 6	318	—	318
Sumatra (Deli)	3 6	—	336	336
Total	—	2,703	1,884	4,587

Source: State Railways annual report for 1940 (Batavia, 1941).

Private concessions are granted for periods of between fifty and ninety-nine years, but usually the State may withdraw the concession at the end of ten years on the payment of an indemnity. Concessions are only granted to Dutch and Dutch colonial subjects. Conditions attached to concessions normally include the carriage of troops at half fare and the free transport of mails. The companies are not subsidized, neither have they a monopoly. They are indirectly aided, however, through the free use of government land for construction. Some of the companies (e.g. the N.I.S.) pay part of their profits to the State.

All the railways confine their operations to railway working only; they neither own nor operate ports, docks, warehouses, hotels or any ancillary services, except a very limited number of road services. Even steamship services, passenger and cargo, between the railway port termini of Java, Sumatra and Madoera, are operated by separate companies.

RAILWAYS IN JAVA

The 3,362 miles of railways in Java comprise a State network, mostly on 3 ft. 6 in. gauge, and a number of private lines, partly main lines and partly local feeders, on gauges of 4 ft. 8½ in. and 3 ft. 6 in. The following table summarizes the position as regards gauge, route-mileage and rolling stock (for 1940 in the case of State railways and N.I.S., 1937 for remainder).

Railway	Gauge ft. in.	Length (miles)	Locomotives			Vehicles	
			Steam	Electric	Motor Coaches	Carriages	Vans and Wagons
State	3 6 1 11½	1,771 49	543 18	13 —	25 —	1,751* 59	14,359 190
Netherlands Indies	4 8½ 3 6	162 369	59 102	— —	— —	99 234	1,791 1,861
Semarang—Cheribon	3 6	236	75	—	—	136	1,404
Semarang—Djoewana	3 6	264	71	—	—	125	1,091
Serajoedal	3 6	78	22	—	—	43	245
Oost-Java (railway)	3 6	46	24	—	—	54	102
Oost-Java (tramway)	3 6	11	—	—	36	26	8
Kediri	3 6	75	28	—	—	16	157
Malang	3 6	53	23	—	—	21	266
Modjokerto	3 6	48	16	—	—	16	157
Pasoeroean	3 6	17	13	—	—	30	138
Probolinggo	3 6	27	11	—	3	22	123
Batavia transport	3 10½	17½	—	—	63	17	29
Madoera	3 6	138	33	—	—	44	323
Total	—	3,361½	1,038	13	127	2,693	22,324

* Includes 14 restaurant cars and 22 buffet cars.

Source: State Railways annual report for 1940 (Batavia, 1941); other lines, from *Indisch Verslag*, 1938, vol. II, pp. 388–91 (Batavia, 1938).

The general pattern of the railway network of Java is apparent from Fig. 111. West of Cheribon, company lines are insignificant, but between the longitudes of Cheribon and Soerabaja they predominate over the State system, which in this part of Java is almost confined to one main east-west line. At the eastern, as at the western end, the State lines are greatly in the majority. On the whole, the network is of fairly even density, greatest in the rich agricultural lands of central Java, least in the inhospitable mountain regions of southern Bantam, Preanger and the south-east coast. The basins and gaps between the volcanic mountains allow frequent, if not always easy, passages for the railway, both east-west and north-south.

The railways are divided into two classes, as shown on Fig. 111. First-class or main lines are those which by reason of their construction and maintenance can accommodate train speeds of over 37 m.p.h. Second-class or secondary lines are the 'steam-tramways' proper; maximum speeds on these lines vary between 12 and 37 m.p.h. There is no restriction on the use of main-line rolling

stock on secondary lines and through-trains are operated between the two classes of railway.

STATE RAILWAYS

The State railway network in Java is divided physically by the Jogjakarta–Solo section of the N.I.S. into two sections, eastern and western, with headquarters respectively at Soerabaja and Bandoeng.

Western Section

The western section of the main line runs from Batavia to Jogjakarta via Cheribon and Kroja junction. There is an alternative, but more difficult, route between Batavia and Kroja, which branches from the main line at Tjikampek and proceeds between the volcanoes and across the Bandoeng and Garoet basins. There is also an alternative route between Batavia and Bandoeng via Buitenzorg (with electric traction as far as this town).

The remaining State lines in western Java are all second-class. They include the northern Bantam line from Batavia to Rangkasbitoeng, branching thence to three small ports on Soenda strait, from one of which, Merak, a steamship company operates a regular service to Oosthaven in Sumatra. There are several branches in the Bandoeng basin and others reaching the north coast at Indramajoe and the south coast at Tjidjoelang. The most important perhaps is that from Maos to the south coast port of Tjilatjap.

The northern plain, east of Batavia, is served by two narrow-gauge branches (1 ft. 11½ in.) radiating from Tjikampek.

Eastern Section

The eastern main line runs from Solo via Madioen to Soerabaja. It has several first-class and also some second-class branches. The former run to Blitar, to Malang and through the eastern part of the island to Kalisat (continued as a second-class line to the port of Banjoewangi). Among the latter are the connecting link between Blitar and Malang and several branches to market centres of the northern and southern plains of Oost-Java.

TECHNICAL FEATURES

Track

All the State lines in Java are single-track, with the exception of 128 miles of double-track and 2½ miles with four tracks. The double-track sections comprise the Batavia–Tjikampek line and the Batavia

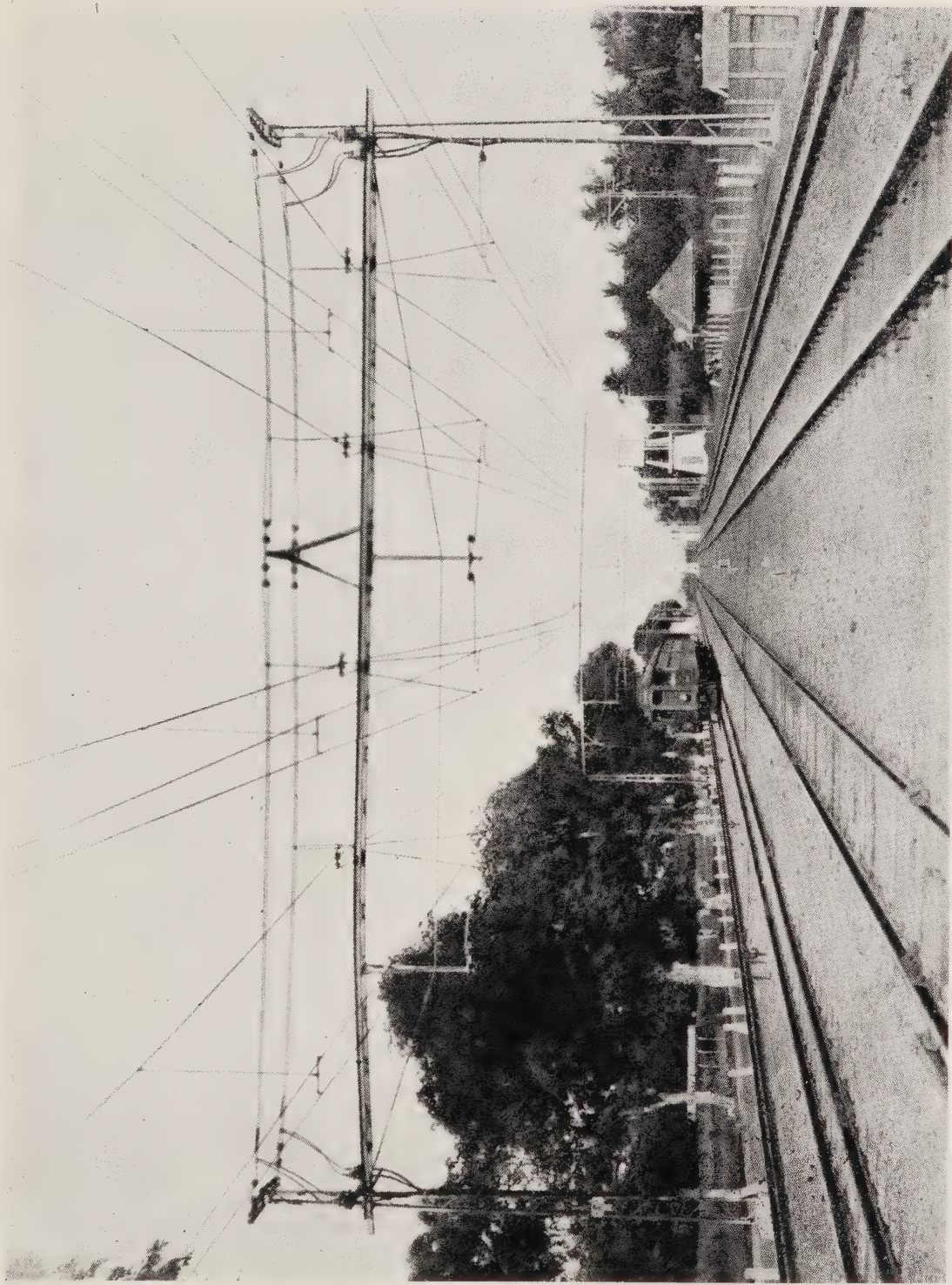


Plate 101. Electrified line near Batavia

The photograph shows the 4-track section between Antjol junction and Tandjoengpriok, with a multiple unit suburban train and details of the 'Siemens-Schuckert' system of overhead wires.



Plate 102. Locomotive, 4-6-4T, for heavy passenger traffic

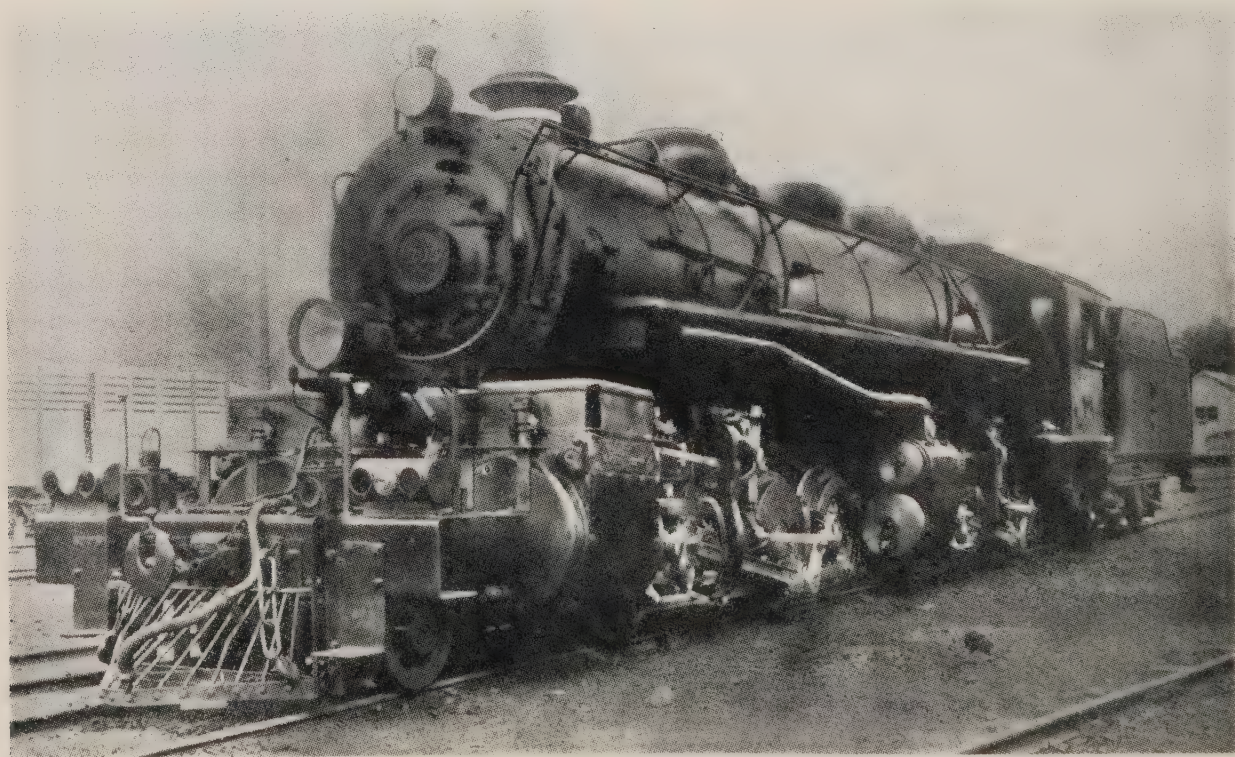


Plate 103. Mallet locomotive, 2-8-8-0, of American build, for use on the mountain lines in western Java

suburban circle in the west, and the Soerabaja–Porong section in the east. The four-track section is between Tandjoengpriok and Antjol Junction, Batavia (Plate 101).

The maximum permitted axle load on the main lines is 15 tons, but on the secondary lines and steam-tramways so high a figure would not obtain. Track construction and maintenance are of a high standard. On main lines 82 lb. per yard rails on soleplates and hardwood sleepers are used on a substantial bed of stone ballast; on secondary lines lighter track, down to 54 lb. rails, is in use. Modern track maintenance methods are employed and there are considerable lengths of welded track.

Signalling

The signalling is modelled on that of the Netherlands. On many main line sections lock-and-block signalling and interlocked points and signals are in operation; on other lines the block system, with telegraphic communication between block posts, is used. Distant, home, starting and junction signals (the latter bracket signals) are used, but home signals for main line and loop are usually on the same post, with the loop home signal under the main line home signal. All signals work in the upper quadrant, horizontal for stop, 45° up for clear; distant signals only show 45° down for caution, 45° up for clear, as is the practice of the Netherlands railways. Signals are operated manually from signal boxes or, on some branch lines, from ground frames.

Fuel

The State railways, in contrast with most of the company lines, burn coal as a locomotive fuel. The coal is obtained from the State-owned mines at Sawahloento and Boekit Asem in Sumatra (see p. 266). Some 264,000 tons of coal were consumed in 1937. Wood fuel is used on the narrow-gauge tramways and on some of the branches which are of 'steam-tramway' type. The 1937 consumption was 20,000 tons.

Electrification

In the Batavia district 80 miles of route, of which 31·6 miles are double track, are electrified on the 1,500 volt d.c. system with overhead contact (Plate 101). The routes are Tandjoengpriok–Batavia and Batavia–Meester Cornelis–Buitenzorg. Multiple unit passenger trains provide the local service, but separate electric loco-

motives are employed for goods traffic, as well as on the through-trains passing through the electrified area (see table on p. 419). Of these the largest are 1-A-AA-A-1 express locomotives built by Brown, Boveri and the Swiss Locomotive Works; they have a power output of 1,500 H.P. and a top speed of 56 m.p.h. There are also some 1-Bo Bo-1 mixed traffic locomotives of 1,200 H.P. and a speed of 46 m.p.h. Electric power is supplied by the *Nederlandsche-Indië Waterkracht Exploitatie Maatschappij*, or, briefly, the N.I.V.E.M.

Rolling Stock

Whereas the former Dutch State Railways in the Netherlands, throughout their separate existence, invariably favoured British traditions in locomotive design, mechanical engineering in the Dutch empire, like signalling and permanent-way design, has followed the partly German-inspired tradition of central and northern Europe. Steam locomotive classes vary, the 2-4-0 and 4-4-0 types being found among the older engines. The most powerful steam locomotives, however, have always been those employed for goods traffic on the mountain sections south-east of Batavia. On these lines 2-12-2 tank engines were formerly employed, but they have been replaced by Mallet articulated compounds of American and European build. The largest are of 2-8-8-0 wheel arrangement, weighing 96 tons, and capable of hauling 600-ton trains on a line with a ruling gradient of 16‰ (1 in 60) and numerous sharp curves. There are also Mallet compound engines of 2-6-6-0 wheel arrangement, for heavy goods, and 0-4-4-2 compound tank engines for use on secondary lines in the mountain area or for lighter goods traffic (Plates 102, 103).

The ordinary express passenger engine is a 4-6-2 type designed and built by the Werkspoor Company of Amsterdam. Locomotives of this type operate the fastest trains between Batavia and Soerabaja, except on the steepest sections where 2-8-2 Ts are employed; they are capable of speeds of 60 m.p.h. where the gradients and the curvature of the track permit. There are also passenger tender engines of 4-6-0 and 4-4-0 wheel arrangement, 2-8-0 goods tender engines, 2-8-2's for mixed traffic and 4-6-4 and 4-4-2 passenger tanks.

Passenger rolling stock attains a very high standard on the best train services and affords an object lesson as to what can be done in spite of the limitations of a narrow gauge and the necessary restrictions in maximum weight. The centre-corridor plan is adopted for day coaches with clerestory roofs and every provision is made for

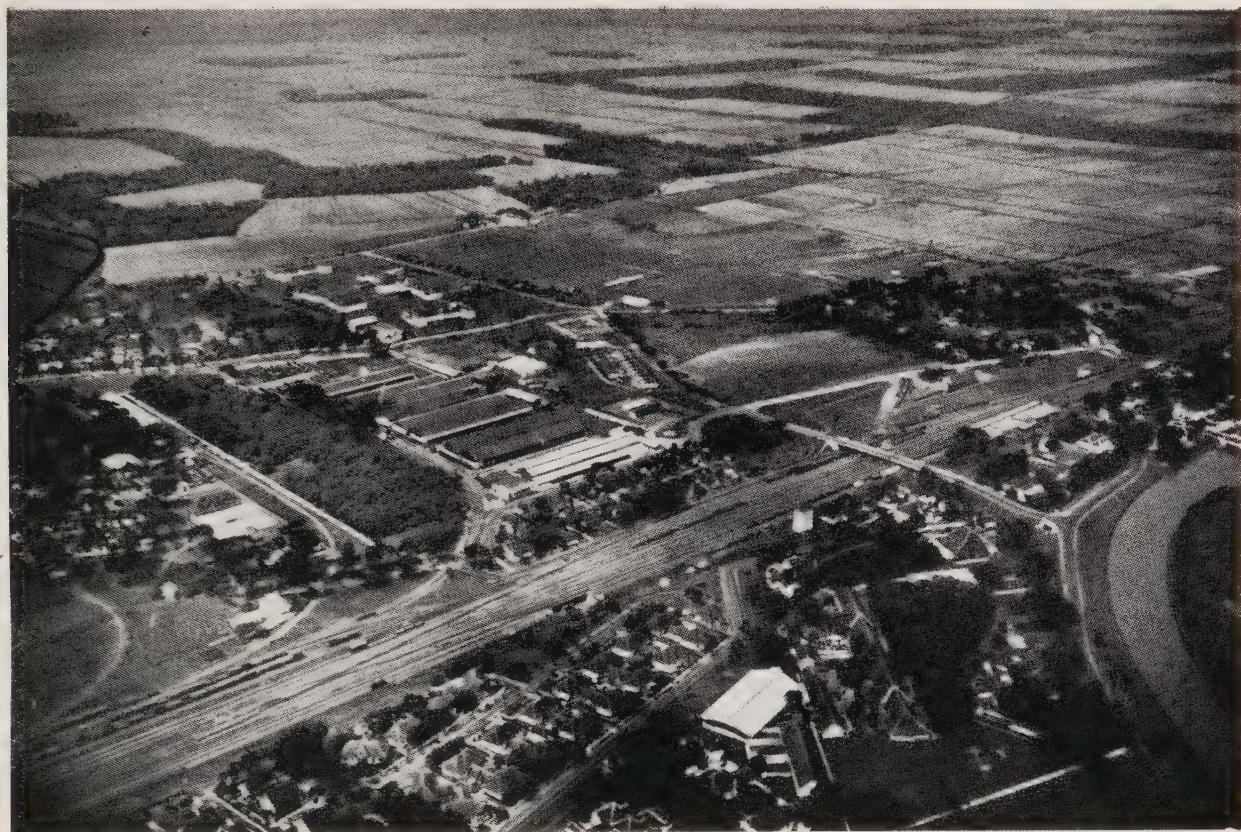


Plate 104. Goebeng workshops, Soerabaja

The concentration of foreign traffic on the port of Soerabaja led to the construction of the main wagon-repair shops alongside the main line at Goebeng (Fig. 73). The shops are in the centre of the picture beyond the railway line.



Plate 105. Railway workshops at Bandoeng

Rolling stock and general repair shops can be seen alongside the main lines.



Plate 106. Bridge over the Tjiliwoeng, Batavia

The main eastbound line crosses the Tjiliwoeng between Manggarai and Meester Cornelis. The train is hauled by a standard 4-6-2 locomotive.



Plate 107. Viaduct on Cheribon-Kroja line

Concrete viaduct over the Kali Belang, on the line crossing the central mountain range. The train is hauled by two 0-4-4-2 compound tank locomotives.

rendering travel as comfortable as possible in a hot, moist climate. There are four classes: buffet, dining and sleeping cars are available only for three classes; the fourth class is for cheap coolie travel.

Goods wagons are light, mostly four-wheeled, with a maximum carrying capacity of between 12 and 15 tons, including a considerable number of tank wagons for molasses traffic from plantations and refineries to ports. Normally goods trains are made up of 60 to 70 wagons with a maximum load behind the tender of 1,000 tons; when traffic demands are heavy they are increased to 100 wagons and to 1,500 tons. On heavily graded sections the weight is usually kept down, even with the Mallets, to 600 tons.

Workshops

The main locomotive workshops are at Madioen. A total of 245 engines passed through these shops in 1940, of which 49 needed major repairs. The main carriage shops are at Manggarai, south of Batavia, on the western side of Meester Cornelis (Fig. 66); in 1940 they dealt with 1,032 vehicles. Manggarai also deals with the electric stock, of which 13 locomotives and 37 vehicles were overhauled in 1940. The main wagon shops are at Soerabaja (Goebang); 4,242 wagons passed through them in 1940 (Plate 104). Apart from these main shops there are important general repair shops at Bandoeng (Plate 105) and smaller establishments at Poerwoeredjo (serving Midden-Java) and Djember (serving Oost-Java).

Speeds and Services

Train speeds are as high as on any 3 ft. 6 in. gauge rails, despite the fact that the routes are by no means easy. Examples of 1940 timings are given in the table below:

Route	Distance (miles)	Overall journey time (hr. min.)		Average speed (m.p.h.)
Batavia-Soerabaja	512	11	30	44.5
Cheribon-Proepoeg	46.6	—	55	50.8
Solo-Madioen	60.8	1	12	50.8
Tjikampek-Cheribon	83.8	1	44	50.8

The times and speeds for the Batavia-Soerabaja run represent the overall figures including the ten intermediate stops aggregating 43 minutes. The other examples quoted are start-to-stop times and speeds for non-stop runs. The longest non-stop run in 1940 was 2 hr. for the 86.9 miles between Kroja junction and Jogjakarta.

Until a few years ago there were no night trains in Java. This state of affairs may have been due in part to a lack of faith in the trustworthiness of the natives who form a very large proportion of the railway staff, but was probably mainly a custom inherited from the Netherlands, where the terminal situation and the absence of long distances rendered night travel for both passengers and freight largely unnecessary. It was only in 1936 that the first sleeping-car express ran between Bandoeng and Soerabaja, to be followed later by similar expresses between Batavia and Soerabaja. Night trains are still a rarity, however, and day travel—with an absence, in equatorial latitudes, of inconvenience due to great seasonal changes in the length of daylight—begins at about 4–5 a.m. and ends at about 7 p.m.

Traffic

The total revenue of the Java State Railways in 1940 amounted to f 32½ million, to which passenger traffic contributed 30% and goods traffic 64%.

Passenger traffic. Passengers in 1940 numbered 37¼ millions, of whom 3.9% travelled first or second class, 30.6% third class, and 55.5% fourth or 'coolie' class. Coolie travel is extremely cheap, so that great importance attaches to the tourist and business traffic which travels in the higher classes and by express trains. Thus in 1940, f 1.8 million, or 18% of the total passenger traffic receipts, were derived from the fares and sleeping car supplements on the day and night express trains between Batavia and Soerabaja, which represent but a very small proportion of the train mileage run.

Passenger traffic is markedly seasonal in character, receipts rising to peaks in July and November, with minima in February and September. This curious phenomenon is clearly a reflexion of the effect of climatic conditions on tourist travel. February is the month of maximum rainfall in many parts of Java, whilst July, though not actually the driest month, is in the drier east monsoon season. November is also a comparatively dry month, with calm conditions at the change-over of the monsoons.

Freight. The composition of the freight traffic in 1940, which amounted to 4.4 million tons, is indicated in Fig. 109. Naturally, agricultural produce is of overwhelming importance, and it is not surprising, therefore, that the freight traffic is markedly seasonal in character. The peak is from July to September—the period of the sugar 'campaign'; during each of these three months traffic commonly

flows at nearly twice the rate of the lowest month, which is usually February or March.

The outstanding item is sugar (including native sugar, factory sugar and molasses). A very large proportion of the sugar production travels

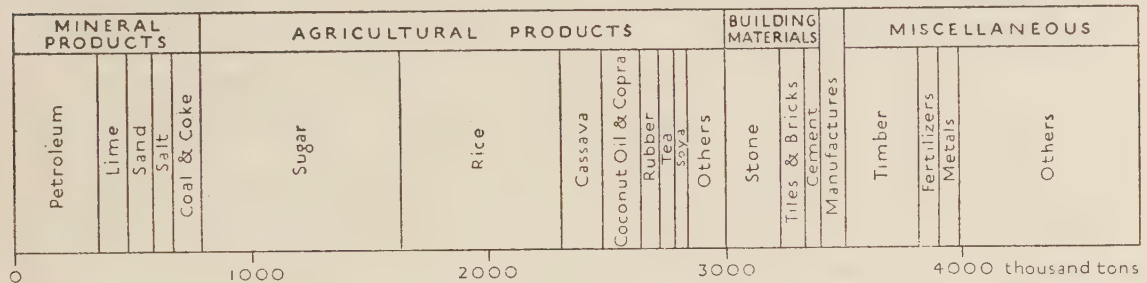


Fig. 109. Freight traffic, J.S.S.

Source: *Staatspoorwegen in Nederlandsch-Indië: Verslag over het jaar, 1940* (Batavia, 1941).

somewhere by rail, and in 1940 over 60% of the factory sugar was sent to Soerabaja for export. Nearly 50,000 wagon loads of sugar were moved, as follows: 33,503 to Soerabaja, 4,705 to Probolinggo, 3,924 to Pasoeroean, 2,959 to Panaroekan, 2,645 to Tjilatjap, and 1,173 to Semarang.

The second item is rice, which moves to the towns and ports from different areas at different seasons. Cassava traffic originates mainly on the Jogjakarta–Soerabaja line and its branches, and on the Bandjar–Tjidjoelang branch. Copra and coconut oil are carried mainly in the west, in Bantam, where the margarine and soap factories of Batavia require raw materials.

Apart from agricultural traffic, two main items are timber—largely teak from eastern forests—and mineral oil—partly imported and partly of Javanese origin, the latter traffic coming to the State railways from the company lines which serve the Rembang oilfields.

DESCRIPTION OF MAIN LINES

Batavia–Soerabaja (via Cheribon and Kroja)

This is the main line followed by both day and night expresses. It is surprisingly easily graded, the only serious obstacle being the 25-mile crossing of the central mountain range between Cheribon and K10ja. Even here the summit is no more than 1,050 ft. above sea level.

From the Koningsplein station at Weltevreden the line proceeds southwards through the urban area to Manggarai, and then crosses the Tjiliwoeng on a viaduct (Plate 106) to Meester Cornelis, where it

joins the line from Tandjoengpriok. It now turns east, and follows the middle of the northern plain of West-Java the whole way to Cheribon. Scores of rivers and streams are crossed, but there is no appreciable gradient.

At Bekasi the line runs along the edge of the recent section of the coastal plain, with flat *sawah* on the north and a rougher landscape to the south. The Tjitaroem is crossed before Krawang, and the line curves south-eastward to Tjikampek junction, where the Bandoeng line diverges southwards and two narrow-gauge branches fan out northwards. Beyond Tjikampek there is a long almost straight stretch, across flat lowland, to Djatibarang, where the Tjimanoek is crossed and a branch runs to Indramajoe. The line now turns south-eastwards approaching the coast, to Cheribon, where junction is effected with the Semarang-Cheribon line.

Beyond Cheribon the line continues south-eastwards, receding from the coast. The Kali Pemali is crossed, and at Songgom the line turns southwards, following the Pemali to Proepoeg, where the edge of the northern plain is reached and the ascent of the mountains begins. There is a steep and sinuous climb for 14 miles to the summit at Kranggan, and an equal descent on the southern side to Poerwokerto, where the western end of the Banjoemas basin is crossed. The gorge by which the Kali Serajoe leaves this basin is followed, partly in a tunnel, and at the southern end of the gorge the line crosses the river and emerges on to the low and flat coastal plain, across which it runs to Kroja junction, where the line from Bandoeng is encountered.

A general easterly direction is now maintained along the inner edge of the coastal plain at an altitude of 33–66 ft. The prevailing flatness is relieved for a few miles as the line crosses the neck of high ground which links the Doewoer hills to the main range behind; a 600-yard tunnel is necessary here. At Koeta'ardja a short branch diverges to Poerwardja, and the main line trends south-eastwards, approaching to within 3 miles of the coast as the coastal plain narrows, and turning inland again to Wates. Beyond here the gradient steepens as the line ascends to the 'terrace' level (about 330 ft.) of the Jogjakarta plain, crossing the Kali Progo en route.

For 37 miles between Jogjakarta and Soerakarta (Solo), the State railways have running powers over the N.I.S. line; standard-gauge and 3 ft. 6 in. tracks run side by side. There is a gentle rise and fall over the densely peopled and intensively cultivated terrain of the Native States, reaching a summit of 508 ft. at Klaten; innumerable streams are crossed, coming down from the Merapi volcano.

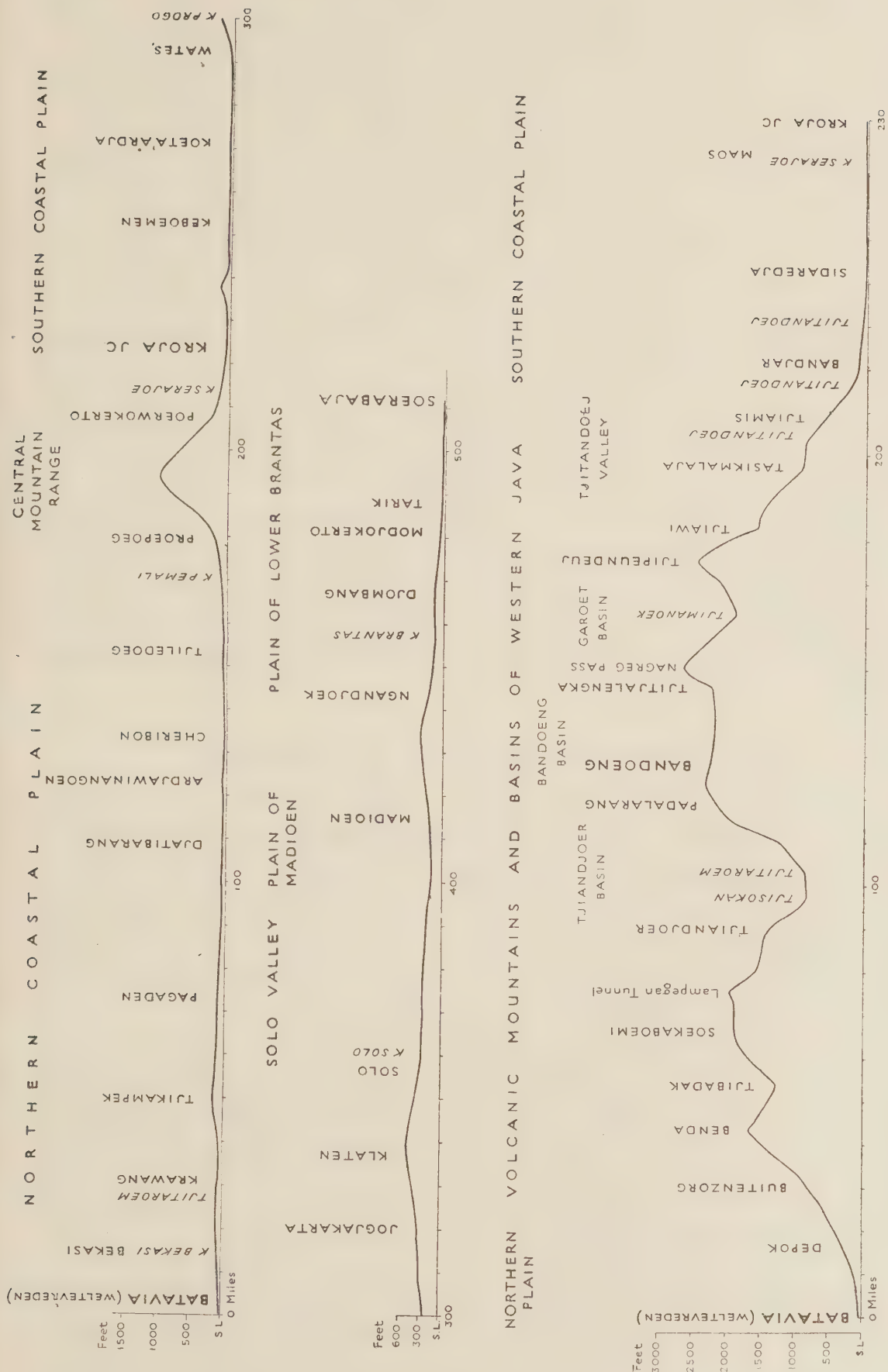


Fig. 110. Gradients on Java railways

Source: Java and Madoera, 1 : 250,000.

Beyond Soerakarta the Kali Solo is crossed, and the line takes a broad northward sweep around the northern foot of the Lawoe volcano, and keeping well away from the Kali Solo which makes an even wider curve. At Madioen (where the locomotive works are on the north side of the line, near the station) the Madioen river is crossed, and the line then turns east to cross the broad col which links the Wilis volcanic group to the central limestone range. The summit level scarcely reaches 400 ft., however, and the line descends thence to the broad plain of Kediri and the lower Brantas. At Kertosono, where the Kediri branch diverges, the Kali Brantas is crossed (Plate 108), and the line continues east-north-east across the plain at a level of about 150 ft. through Djombang (junction of branch to Babad, and of the Kediri steam-tramway lines), dropping to nearer the river level again at Modjokerto (junction of the Modjokerto steam-tramway). At Tarik an alternative route into Soerabaja via Sidoardjo diverges, and the main line proceeds north-eastwards via Krijan, meeting the other route at Wonokromo, at the southern end of Soerabaja. The last few miles run northwards, following the Soerabaja river, past the Goebang workshops and terminating at the Kotta station, with an extension to the harbour station of Kalimas (Fig. 73).

Batavia-Kroja Junction (via Buitenzorg and Bandoeng).

In contrast with the main route to Soerabaja, this line is mountainous in character. The first 31 miles to Buitenzorg are electrified.

Diverging from the Cheribon line at Manggarai, on the southern outskirts of Batavia, the line runs southwards up the Tjiliwoeng valley, generally within $\frac{1}{2}$ to 1 mile of the left bank of the river, and rising steadily to an altitude of 866 ft. at Buitenzorg. Buitenzorg lies on a narrow interfluvium between the Tjiliwoeng and the Tjisadane, and the line now follows the Tjisadane southwards, making for the broad gap which separates the Salak volcano from the Pangrango-Gede mass. The gradient increases, and a summit level of 1,740 ft. is reached at Benda. There follows a descent of the upper Tjitjatih valley to Tjibadak, and the line turns east and climbs to the level of the Soekaboemi plateau, crossing many streams on the lower slopes of the Pangrango-Gede mass.

Climbing slightly across the plateau, the Indian ocean-Java sea watershed is crossed in Lampegan tunnel, and there follows a rapid descent to Tjibeber, after which the line curves northwards across a lake-studded plain to Tjiandjoer. The descent is resumed as the line

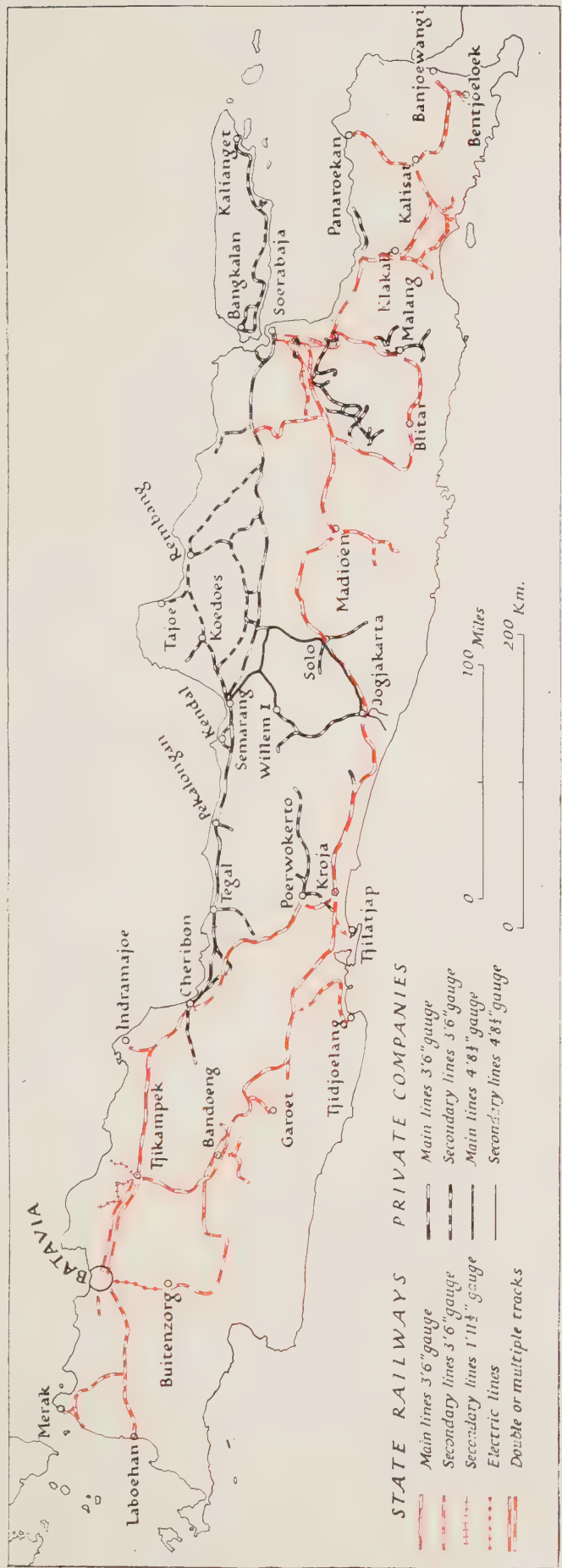


Fig. 111. Railways of Java
 Source: *Railway Gazette*, 10 April 1942 (London, 1942)

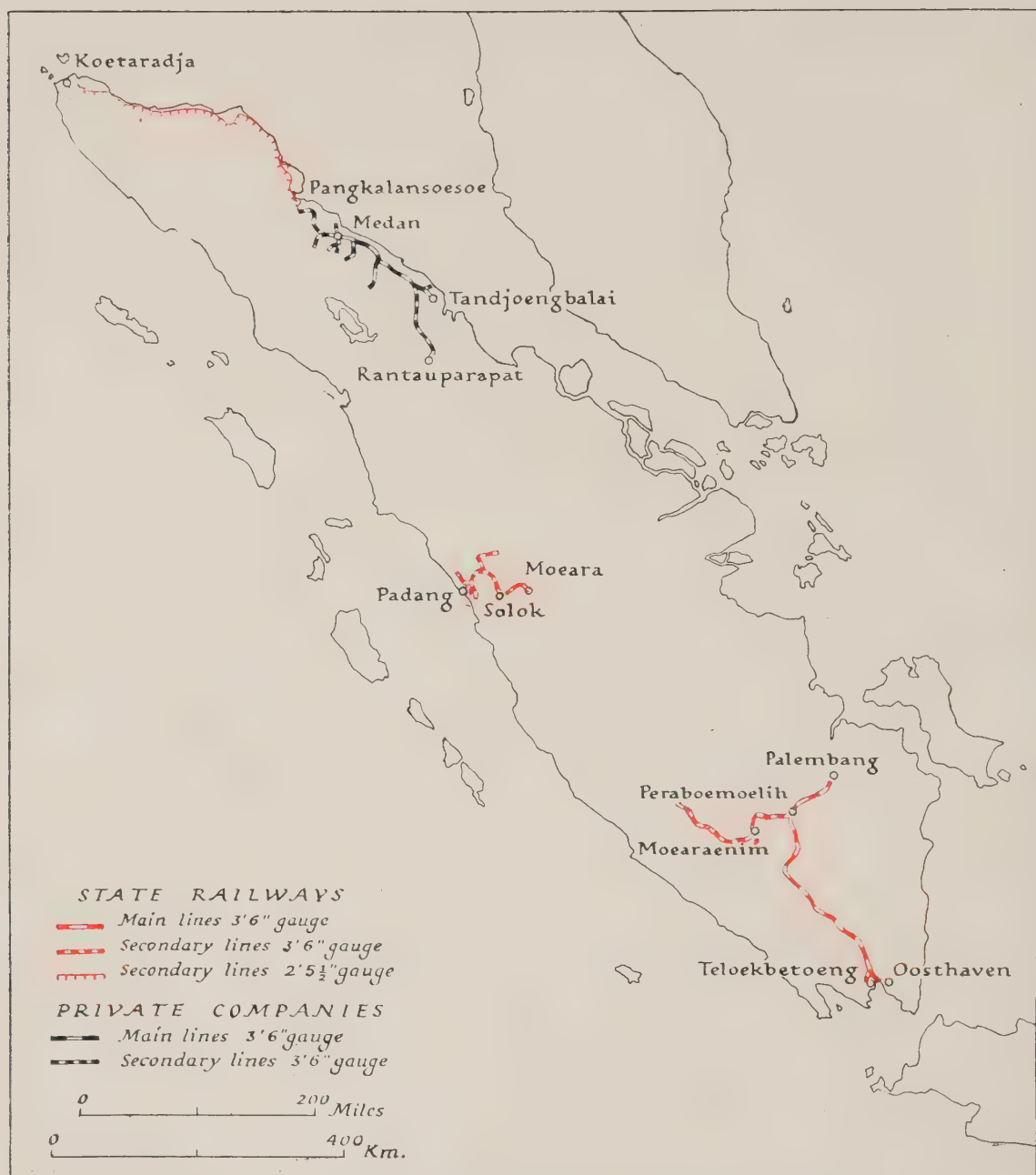


Fig. 112. Railways of Sumatra

Source: *Railway Gazette*, 10 April 1942 (London, 1942).

curves eastwards across the terraced *sawah* to the bottom of the Tjisokan trough. After crossing the Tjisokan there is a more or less level stretch to the crossing of the Tjitaroem, and then follows the severest climb of the whole route, carrying the line from a level of 886 ft. to 2,250 ft. at Padalarang, in 16 miles. At Padalarang the shorter route from Batavia via Tjikampek is joined, and a double-track line continues south-eastwards, rising over the lip of the Bandoeng plateau and descending slightly to its floor (about 2,350 ft.).

Beyond Bandoeng the line continues south-eastwards across the plateau for 18 miles and then rises sharply to cross the ridge which separates it from the Garoet basin. It winds through the Nagreg 'pass', (2,790 ft.) with many curves, cuttings and viaducts, and descends in an equally sinuous fashion to the floor of the basin, crossing the Tjimanoeck just before Tjibatoe, junction of the Garoet branch.

Another steep and sinuous climb follows, carrying the line across the last volcanic range, and after a summit of about 2,600 ft. near Tjipeundeuj there is a longer and steeper south-eastward descent to the Tjitandoej valley, which is followed, more or less, for over 40 miles. At Tasikmalaja, junction of a short branch to Singaparna, the direction changes to eastward. It is not always convenient to follow the Tjitandoej, and this river is twice crossed before Bandjar, where the line to Penandjoeng bay branches off.

Beyond Bandjar the line descends to the great marshy lowland of the lower Tjitandoej, and after crossing the river for the last time keeps to the eastern edge of this plain, which is only a few feet above sea level. Curving eastwards to avoid the swampy jungle east of the Segara Anakan, the line crosses the Kali Serajoe about 6 miles above its mouth, and gives off a branch to Tjilatjap. At Maos junction the Serajoedal steam-tramway is encountered, and a few miles further on is Kroja junction, where the main line from Cheribon runs in.

COMPANY RAILWAYS

Netherlands Indies Railway Company (N.I.S.)

This company, the earliest to be founded in the Dutch colonial empire, has its headquarters in the Netherlands, but is administered locally. It controls 162 miles of standard-gauge track and 369 miles of medium-gauge (3 ft. 6 in.). The main standard-gauge line—the *Vorstenland* line—runs from Semarang via Goendik to Soerakarta

(Solo) and Jogjakarta, with a branch from Kedoengjati to Willem I. A second-class line on the same gauge runs south from Jogjakarta to Brossot and Poendoeng. The main 3 ft. 6 in. gauge line runs from Semarang to Soerabaja; there is a second-class line connecting Willem I. and Jogjakarta, another short line linking Goendik to the Semarang-Soerabaja line, and two branches radiating from Solo. Mention must also be made of the 3 ft. 6 in. gauge line which parallels the standard-gauge track between Jogjakarta and Solo; over this the State railways have running powers.

The main Semarang-Jogjakarta line takes a somewhat circuitous route to avoid the great volcanic mountain mass of Merapi-Merbaboe; the distance is 103 miles as against 71 miles by road. Construction was not easy, and involved two large bridges, over the rivers Toentang and Serang respectively. The branch from Kedoengjati to Willem I. (the large fortress just outside Ambarawa) was projected for military purposes; it is a difficult route, involving a climb of 1,436 ft. The later continuation of this line southwards via Magelang to Jogjakarta is on 3 ft. 6 in. gauge and is worked by rack-and-pinion over its summit section, which reaches 2,332 ft. at Bedono, on the divide between the Ambarawa basin (Kali Toentang) and the southward-flowing Kali Elo valley in which Magelang lies.

The principal standard-gauge locomotive types are 4-6-0 passenger tender engines, 4-4-2 passenger tank engines and 2-6-0 goods tender engines. All the locomotives burn wood fuel, of which 98,000 tons were consumed in the year 1937. For rolling stock statistics see the table on p. 419. There are workshops at Semarang and Jogjakarta.

Traffic in 1939 amounted to 7 million passengers and 1.3 million tons of freight; the former contributed 16% of the total receipts (which amounted to f 8 million), the latter 78%.

Semarang-Cheribon Steam-Tramway

Semarang-Djoewana Steam-Tramway

Oost-Java Steam-Tramway

Serajoedal Steam-Tramway

These four steam-tramway companies have a joint board of directors in the Netherlands and a joint representative in Java with headquarters at Semarang; they are financially independent and each has its own management. Geographically, the four lines form a system occupying most of north-central Java between Cheribon on



Plate 108. Bridge over the Kali Brantas at Kertosono



Plate 109. Maos Junction

Maos lies on the Bandoeng-Kroja line, near the junction of the Tjilatjap branch, and is also the western terminus of the Serajoedal Steam-Tramway. The wood-burning locomotive on the left is an old 4-4-0.



Plate 110. Viaduct over the Tjibesoro

This is one of many similar trestle viaducts on the mountain lines in western Java. It is on the Krawang-Padalarang section of the Batavia-Bandoeng direct line.

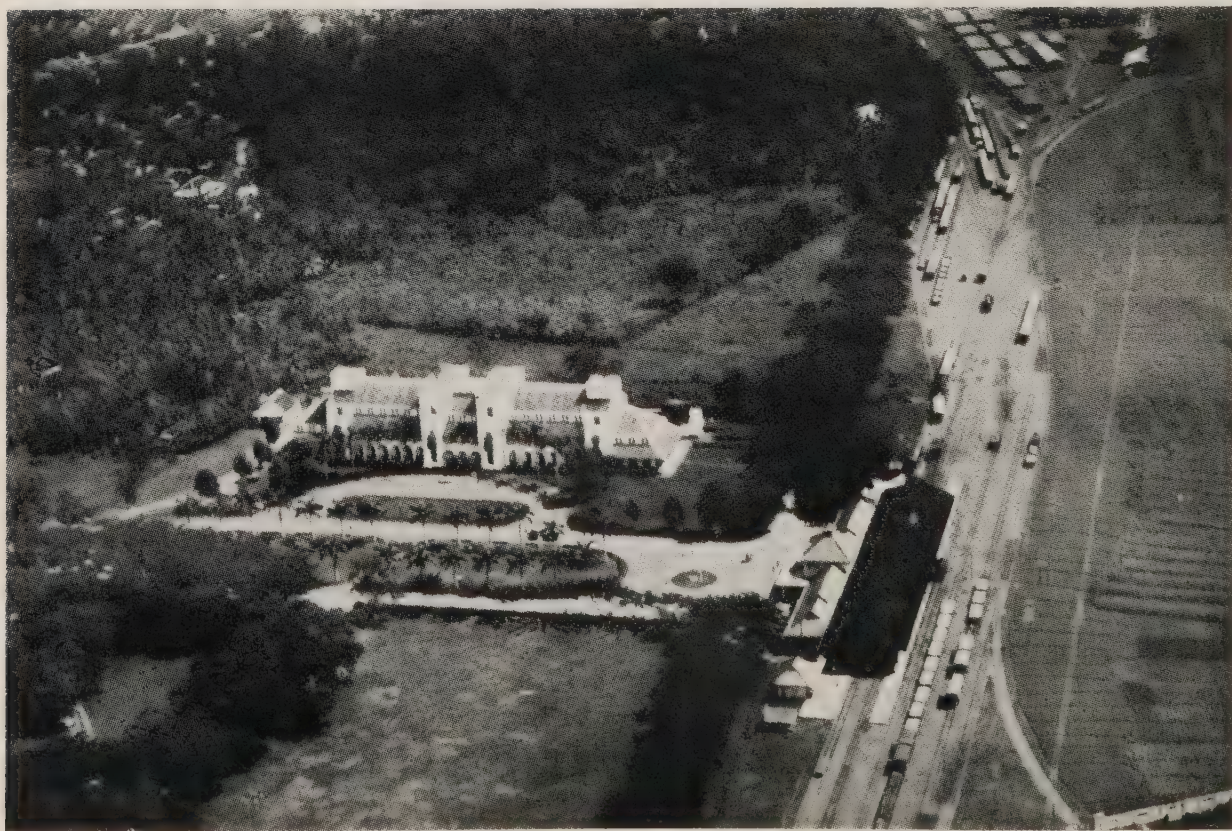


Plate 111. Headquarters of Semarang-Cheribon S. T. at Tegal

The view shows the station, goods yard and locomotive sheds (top right) and the palatial administrative headquarters building with the village built for the company's employees (top left, amongst the trees).

the west and Soerabaja on the east. Three of the lines are interconnected, but the Serajoedal line is isolated from the others. The total length of route operated is 620 miles, all on 3 ft. 6 in. gauge, and there is, in addition, an electrified tramway system in Soerabaja which is operated by the Oost-Java company. The main line between Semarang and Cheribon is a first-class railway, but the remainder of the system is more truly of the 'steam-tramway' character.

Semarang-Cheribon Steam-Tramway

This company controls a first-class main line 138 miles in length between Semarang and Cheribon, and second-class branches from this trunk which bring the total length of the route to 235 miles. The headquarters are at Tegal (Plate 111). Apart from a large passenger traffic due to the importance of the main line as part of a through route from Batavia to Soerabaja, the main function of the system is to serve upwards of thirty sugar factories, which send their produce to the small ports of Cheribon, Tegal, Pekalongan and Semarang, or via Semarang and the N.I.S. line to Soerabaja. In 1937, for example, there were 2.9 million passengers and 707,000 tons of freight. Fuel consumption in the same year was 30,000 tons of wood.

Semarang-Djoewana Steam-Tramway

This was the first 'steam-tramway' in Java. Its first line linked the two ports, after which it is named, and several sugar factories. The network has grown to cover the territory between the N.I.S. Semarang-Soerabaja line and the sea, with two roughly parallel east-west lines and several branches totalling 266 miles, all on 3 ft. 6 in. gauge and all second-class. Included in the total are the 5 miles of the Semarang urban tramway system.

The first main line runs from Semarang via Djoewana, Rembang and Djatirogo to Bodjonegoro on the N.I.S. line. The second branches from the first at Demak and runs up the Loesi trough via Poerwodadi to Blora and thence to Tjepoe on the N.I.S. line. The two lines are connected between Rembang and Blora, and branches run northwards into the Moerjo peninsula and southwards to make further connections with the N.I.S. line. The lines run for the most part alongside roads; the maximum speed is limited to 18½ m.p.h. The locomotives burn wood fuel; in 1937 they consumed 21,000 tons. The headquarters, warehouses and workshops are at Semarang (Plate 113).

The total passenger traffic is considerable, but two-thirds of it is due to the Semarang tramways. In 1937 it amounted to 7.6 millions

(4·7 millions in Semarang). Freight traffic, which totalled 300,000 tons in 1937, comprises sugar (from seven factories), teak, rice and kapok.

Oost-Java Steam-Tramway

This line is in two separate parts, the Soerabaja tramways and the steam-tramway proper. The former comprises 11 miles of double-track electric tramways, exclusively for passenger traffic, and the latter 46 miles of steam-tramway in two separate lines, one running through the streets of Soerabaja (Plate 112) from Oedjoeng (east of Tandjoengperak harbour) to Wonokromo and thence south-westwards to Sepandjang and Krijan, and the other from Modjokerto to Ngoro. The steam locomotives consumed 7,200 tons of wood fuel in 1937. The chief freight traffic is sugar; the passenger traffic is considerable; in 1937 there were 3·9 million passengers on the steam-tramways and 6·5 millions on the electric trams.

Serajoedal Steam-Tramway

As its name implies, this line serves the valley of the Kali Serajoe. It runs from Maos junction (on the main line of the State railways, where the Tjilatjap branch diverges) up the valley to Wonosobo; there is a short branch to Poerbalingga. From Maos the line runs north-eastwards, following the Kali Serajoe through the gorge to the Banjoemas basin. At Poerwokerto it turns east, and maintains this direction, climbing steadily to an altitude of 948 ft. at Bandjarnegara, at the eastern end of the basin. The last 17 miles to Wonosobo, following the terraced slopes of the upper Serajoe valley, are steeper and more picturesque. An altitude of 2,559 ft. is reached at the terminus.

Traffic over the Serajoedal line in 1937 amounted to 1·5 million passengers and 85,000 tons of freight, the latter mostly sugar from four factories, destined for transfer to the State line at Maos, for export from Tjilatjap. Fuel consumption in 1937 was 6,500 tons of wood.

Notes on Minor Steam-Tramway lines

Kediri S. T.—Comprises several lines serving the rich sugar-growing land east of Kediri rising up to the foot of the Ardjoeno-Welirang volcanic mass. Main line runs from Kediri via Pare to Djombang. Traffic, 1937: 902,000 passengers and 141,000 tons freight.

Malang S. T.—Serves the area east of the State railways Malang line. Runs from Singosari via Boeloelawang to Kepandjan, with branches to Dampit and Toempang. Traffic, 1937: 823,000 passengers and 240,000 tons freight.

Modjokerto S. T.—Serves the plain of the Kali Porong, between Modjokerto, Porong and Bangil. Traffic, 1937: 272,000 passengers and 55,000 tons freight.



Plate 112. A typical 'steam-tram'
On the Oost-Java line, in the streets of Soerabaja.

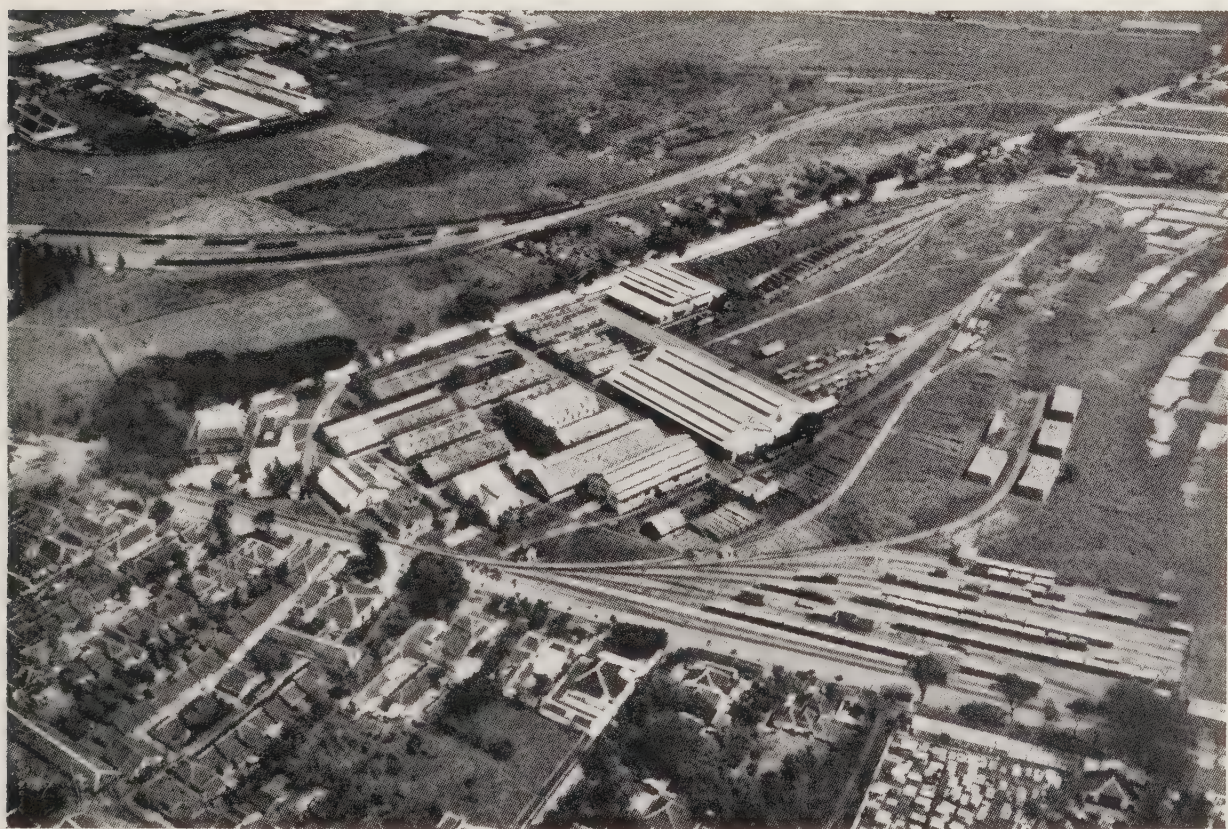


Plate 113. Headquarters of Semarang-Djoewana S. T. at Semarang
View looking north-westwards across the goods yards, workshops and administrative buildings at Pengapon, on the north-eastern side of Semarang. On a curve in the distance is the line of the Netherlands Indies Railway.



Plate 114. The Atjeh Railway at Koetaradja

The main station, with locomotive shed to the right; looking south-east.



Plate 115. Mixed gauge at Besitang

Junction of the Atjeh Railway (2 ft. 6 in. gauge) with the northern branch of the Deli Railway (3 ft. 6 in.). The mixed gauge track runs from Besitang to the port of Pangkalansoesoe.

Pasoeroean S. T.—Runs inland from the port of Pasoeroean to Poerwosari, with two short branches. Serves sugar estates. Traffic, 1937: 269,000 passengers and 172,000 tons freight.

Probolingo S. T.—Runs along the coastal plain eastwards from Probolinggo via Kraksa'an to Paiton. Serves sugar estates. Traffic, 1937: 202,000 passengers and 74,000 tons freight.

On all these steam-tramways the diminutive locomotives are for the most part wood-burning; but the Pasoeroean and Probolinggo lines, which have easier access to seaborne coal, use coal as well.

Batavia Transport Company.—This is an urban electric tramway system (Fig. 66). Traffic, 1937: 7.1 million passengers.

Madoera Steam-Tramway

The island of Madoera has a steam-tramway serving the more important agricultural areas of the south and west. The main line runs from the small port of Kamal, linked by ferry across the roadstead to Oedjoeng (Soerabaja), eastwards to Pamekasan, Soemenep and Kalianget. For much of the way it follows the coast closely, but turns inland to avoid the marshy areas (covered with *sawah*, fish-ponds and salt-pans) around the lower Kali Baliga, the Koeala Boender and the Koeala Saroka. A branch line runs north from Kamal to Bangkalan, then curving inland, south-eastwards and joining the main line again at Kebanjar-Timoer. With short exceptions the track is laid along the roads. The traffic in 1937 amounted to just over a million passengers and 81,000 tons of freight. In contrast to almost all the other company lines, the Madoera railway uses coal as a locomotive fuel, presumably owing to the lack of suitable wood in this rather dry island, and to the easy accessibility to seaborne coal from Sumatra and Borneo. In 1937 the coal consumption was 6,700 tons.

RAILWAYS IN SUMATRA

The 1,227 miles of railway in Sumatra are widely dispersed in three separate areas, and in none of these do the lines form a 'network' such as exists in Java (Fig. 112). Four separate 'systems' exist, and certain figures of mileage and rolling stock relating thereto are tabulated below.

As in Java, and on the same basis of permissible speed (see p. 419), the lines are classified as first or second-class (Fig. 112). It so happens, however, that some of the second-class lines are of prime importance as regards freight traffic, their designation being due simply to the gradients and curvature of the track which reduce the speed limit.

Railway	Gauge ft. in.	Length (miles)	Locomotives			Vehicles	
			Steam	Electric	Motor Coaches	Carriages	Vans and Wagons
<i>State Railways:</i>							
South Sumatra (Z.S.S.)	3 6	401	56	—	—	152*	1,250
West Sumatra (S.S.S.)	3 6	164	59	—	—	137	1,010
Atjeh (A.S.S.)	2 6	318	47	—	—	156	1,031
<i>Company Railways:</i>							
Deli Railway	3 6	344	61	1	10	224	1,858

* Includes 2 restaurant cars and 4 buffet cars.

Source: State Railway annual report for 1940 (Batavia, 1941).

STATE RAILWAYS

South Sumatra (Zuid-Sumatra Staat Spoorweg—Z.S.S.)

This division of the State railways comprises a first-class line running from Kertapati (on the Air Moesi opposite Palembang) via Praboemoelih and Batoeradja to Teloekbetoeng and Oosthaven at the head of Lampoeng bay; and a second-class line, actually of greater commercial importance, branching at Praboemoelih and running to the coal and oil centres of Moearaenim and Lahat, continuing thence along the foothills of the Barisan ranges to Loeboeklinggau. The State coal mines at Boekit Asem are actually tapped by a short branch which runs southward up the Enim valley from Moearaenim. The Kertapati–Oosthaven line, already ‘first-class’, was in course of improvement in 1940–41, to raise its permissible speed to 46 m.p.h.

Passenger traffic on this system amounted in 1940 to just over two million, bringing in receipts of just over one million guilders, a sum

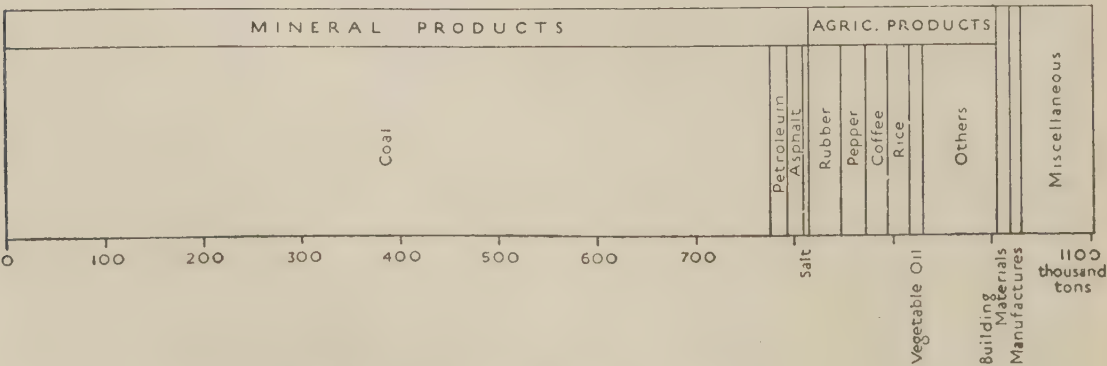


Fig. 113. Freight traffic, Z.S.S.

Source: *Staatspoorwegen in Nederlandsch-Indië: Verslag over het jaar 1940* (Batavia, 1941).

representing about 22% of the total receipts. Freight traffic, which is clearly more lucrative, amounted in the same year to just over one million tons, with receipts of f 3½ million. Over three-quarters of the tonnage carried was coal from the Boekit Asem mines (Fig. 113). The remainder comprised agricultural products for the most part, with some mineral oil. Rubber, coffee, pepper and rice were the more important of the former, with smaller quantities of sugar, palm oil and timber, and a number of miscellaneous products.

The headquarters and workshops of the line are at Lahat. The shops dealt in 1940 with 35 locomotives (15 for heavy repairs), 114 carriages and 537 wagons.

Description of Routes

Oosthaven line. From Kertapati terminus the line runs in a general south-westerly direction for the first 47 miles to Praboemoelih junction, keeping to the slightly higher ground, about 16–65 ft. above sea-level, of the interfluvium between two tributaries of the Air Moesi. Just before Praboemoelih it curves south, and beyond the junction runs south-south-east across the grain of the country to the Air Ogan valley, crossing several fair-sized river courses at right angles, but without any sharp changes of level. On reaching the Ogan valley, about 84 miles from Kertapati, the line turns south-west and follows river and main road upstream to Batoeradja, where the altitude is still no more than 144 ft.

The Air Ogan is crossed at Batoeradja, and the line then strikes south-eastwards, across-country again, rising and falling over the interfluvium (altitude just over 300 ft.) between the Ogan and Komering rivers. Crossing the Air Komering at Martapoera, a south-easterly direction is maintained for a considerable distance, through country only comparatively recently colonized. Several large rivers are crossed—the Dempoe, Besai and Rarem—the last named at Koeta-boemi. Then, at Blambangan, the line curves south-south-east, crossing the Wai Sepoetih, the Wai Sekampoeng and many of their eastward-flowing tributaries. Beyond the Sekampoeng valley the line climbs once more to over 300 ft. to cross a spur of volcanic foothills, before descending to the lowland at the head of Lampoeng bay. At Geroentang junction a short branch is given off, running westwards to Teloekbetoeng; the main line continues round the head of the bay to the port of Oosthaven.

From Oosthaven a steamer service makes connection with the Java State railways at Merak.

Lahat line. From Praboemoelih junction this line runs due westwards to the Air Lematang valley, which it follows for some miles curving south to Moearaenim (altitude c. 110 ft.). The important coal branch runs southwards from Moearaenim for 8 miles to Tandjoeng, where contact is made with the Boekit Asem coal mines on the western side of the Enim valley, and with oil wells in the Soebandjeridji district further away on the eastern side. The main line from Moearaenim runs generally south-westward up the Lematang valley, passing the Bandjarsari oilfields, to Lahat.

During the 'thirties this line was in course of extension north-westward, with the possible intention of linking up ultimately with the West-Sumatra line, though this would be a formidable undertaking. By 1938 it had penetrated beyond Tebingtinggi, on the upper Moesi, to Loeboeklinggau, and no further construction had taken place up to the time of the Japanese invasion.

West-Sumatra (Sumatra's Westkust Staat Spoorweg—S.S.S.)

The railway system of western Sumatra comprises a trunk line from Emmahaven and Padang, via Padangpandjang and the shores of the Singkarak lake, to the State coal mines in the Oembilin basin, with several branches. The system spreads over the Barisan ranges and basins and attains a maximum altitude of about 3,900 ft. between Padangpandjang and Fort de Kock. It is difficult railway terrain, and there are no less than seven sections worked by rack-and-pinion (Fig. 115); in consequence, speeds are slow and the whole system is 'second-class'.

Passenger traffic amounted in 1940 to 3.3 millions, but the receipts from this traffic represented only 16% of the total receipts, a fact which serves to emphasize the importance of the main line for coal traffic. The total freight tonnage carried in 1940 was 875,000, bringing

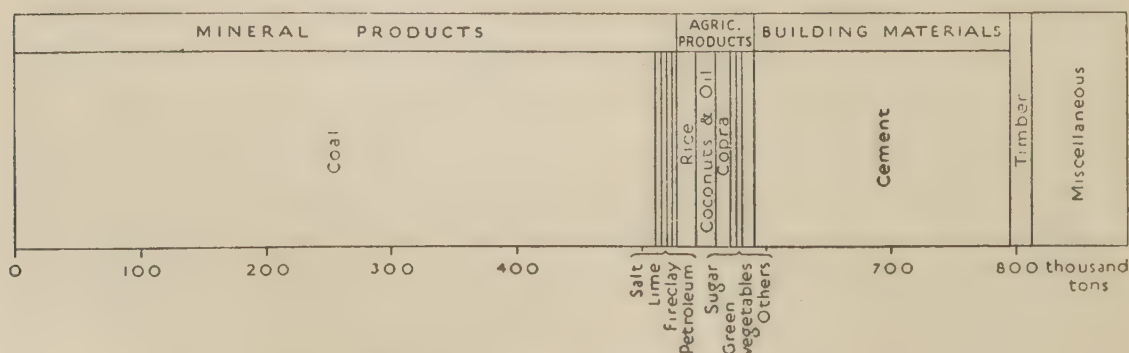


Fig. 114. Freight traffic, S.S.S.

Source: *Staatspoorwegen in Nederlandsch-Indië: Verslag over het jaar 1940* (Batavia, 1941).

in receipts of just over *f* 2 million. Some 58% of the tonnage consisted of coal from the Oembilin field (Fig. 114), and as the bulk of the coal took the long journey down to Emmahaven for export, the value of this traffic is clearly greater than the mere tonnage figures would suggest. The second item is Portland cement, from the factory at Indaroeng, about 7 miles inland from Padang and connected to the line by a cable-way. All other traffic is very small compared with these two. They comprise agricultural and forest products for the most part, including coconuts (with oil and copra), timber, rice, sugar, fresh vegetables and a great variety of miscellaneous items.

The headquarters and workshops for the West-Sumatra line are at Padang. Through the shops in 1940 passed 25 locomotives (9 for heavy repairs), 48 carriages and 358 wagons.

Description of Route

Main line. From Emmahaven pier the line runs along the northern shore of the bay, turning inland to Boekit Poetoes, where the cement factory's ropeway meets it. Continuing north, past the electric power station, it crosses the Batang Arau into Padang. A short branch runs south-westwards from Padang station to Poeloe Ajer, the old port of Padang on the northern bank of the mouth of the Batang Arau.

From Padang the line runs northwards along the coastal plain, following the main road and crossing a number of sizeable rivers, including the Batang Anai, whose course it then follows to Loeboekaloeng. Here a branch diverges westwards across the plain to reach the coast at Pariaman, thence running along the shore for a few miles to an insignificant terminus at Naras.

The main line continues northwards, seeking an easier way into the mountains than the gorge of the Batang Anai. It follows instead the Batang Oelakan, and then curves east to rejoin the Anai at Kajoe-tanam. From here to Padangpandjang the scenery of the Anai gorge ('Anaikloof') is spectacular, and the line is worked by rack-and-pinion. The wildest part of the gorge (Plate 116) is halfway to Padangpandjang, where the line curves eastwards and tunnels through the narrowest section. Padangpandjang, 2,542 ft. above sea-level, is the point of divergence of the Pajakoemboeh branch.

From Padangpandjang the main line strikes east and then south-east, following the general trend of the trough which lies between the western and eastern Barisan ranges. It descends steeply, with three more rack-and-pinion sections, to the shores of lake Singkarak, only 1,214 ft. above sea-level (Plate 117). Following the eastern shore

of the lake to its southern end, the line continues along the trough, making a gentle ascent of the Batang Soemani valley to Solok. Here it turns east, and another difficult section follows, as the line crosses the relatively low eastern Barisan range by the valley of the Air

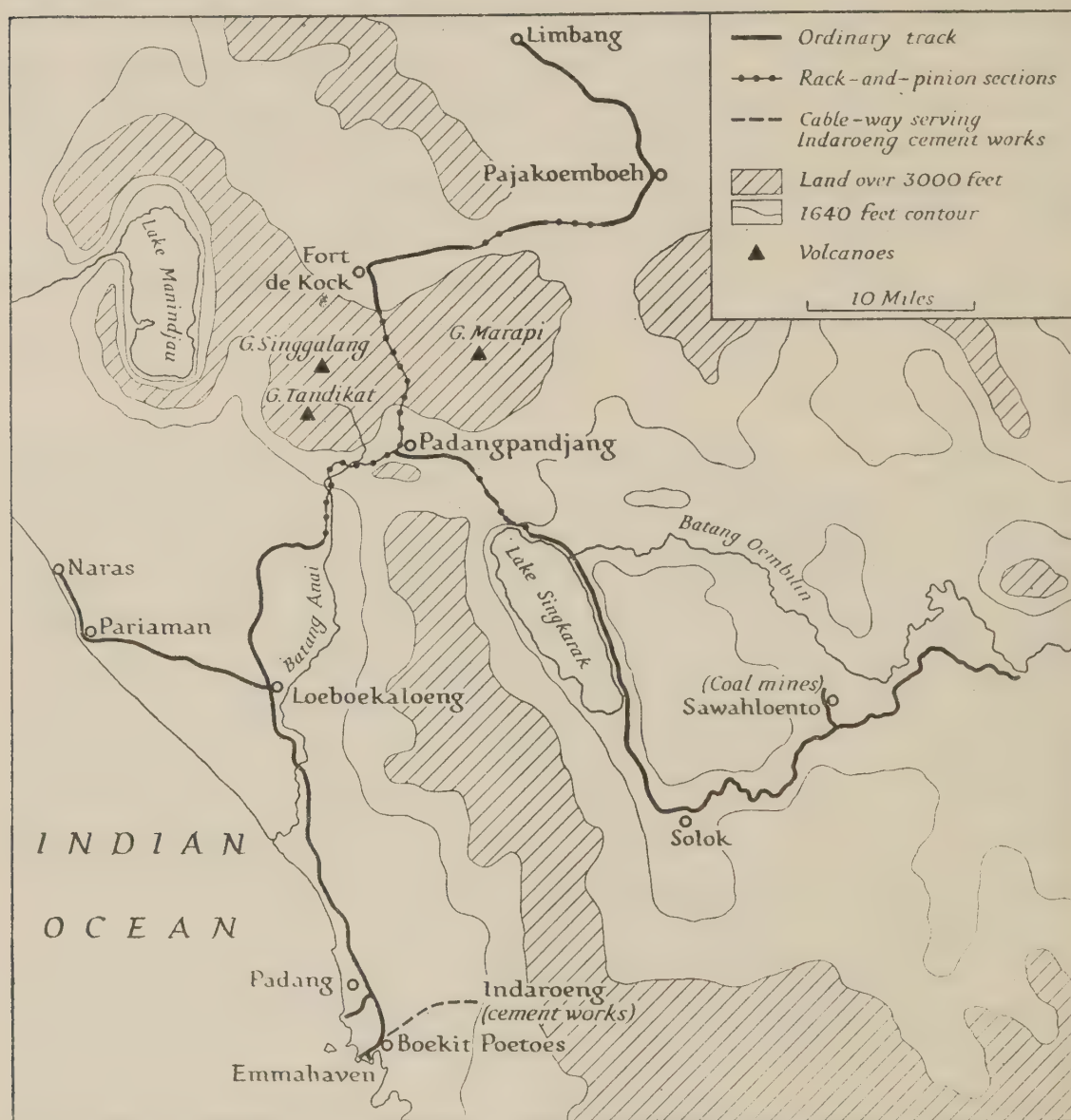


Fig. 115. The West-Sumatra railway (S.S.S.) in the Padang region

Source: *Van Stockum's Traveller's Handbook*, by S. A. Reitsma (The Hague, 1930).

Siloenkang. A rise to over 1,600 ft. is followed by a descent of the Siloengkang valley, and at Moearakalaban the line turns north and tunnels under a hill spur to the Loento valley at Sawahloento, the coal mining centre, 900 ft. above sea-level.

Branches. The main line is continued from Moearakalaban, down the Siloengkang valley to its junction with the Oembilin, and thence

cutting across the hills to Moeara, where the Oembilin joins the Batang Koeantan.

The Pajakoemboeh branch runs northwards from Padangpandjang, ascending steeply by rack-and-pinion track to a summit at Kotabaroe, about 3,900 ft. above sea-level, and halfway between two giant volcanoes, Marapi on the east and Singgalang on the west. There is a similar northward descent, and the rack-and-pinion section ends at Padangloear, a few miles from Fort de Kock, where the altitude is about 3,000 ft. Here the line turns east, and crosses the eastern Barisan range to the Pajakoemboeh basin, with two rack-and-pinion sections. At Pajakoemboeh, only 1,683 ft. above sea-level, the line turns north-westwards across the floor of the basin to a terminus at Limbang.

Atjeh (Atjeh Staat Spoorweg—A.S.S.)

This narrow-gauge line runs from Oeleëlheuë, the port of Koetaradja, to Pangkalansoesoe. For the greater part of its course, except for the Koetaradja–Sigli section which runs inland behind the Goudberg volcanic mass, it follows the coast in a general way, curving inland only to avoid deltaic swamps and jungles. It serves all the small ports round the coast—Sigli, Meureudoe, Bireuen, Lhokseumawe, Idi, Langsa and Koealasimpang. At Besitang it joins the Deli Railway and curves north, and a third rail carries rolling stock of both gauges to the port of Pangkalansoesoe (Plate 115).

Construction commenced at the northern end for military purposes only, but the line has been extended south-eastwards for commercial

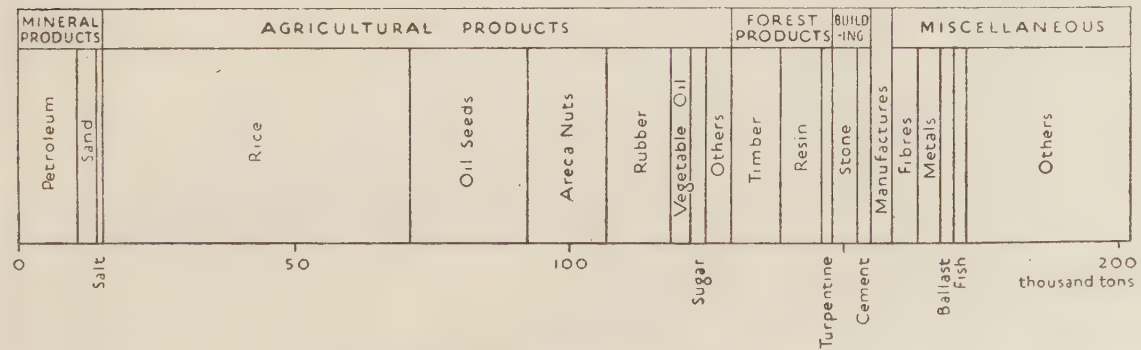


Fig. 116. Freight traffic, A.S.S.

Source: *Staatspoorwegen in Nederlandsch-Indië: Verslag over het jaar 1940* (Batavia, 1941).

reasons, and the last section was completed in 1916, serving oilfields and European-owned plantations. Passenger traffic in 1940 amounted to 3.17 millions, the receipts from which represented 30% of the total

receipts. Freight traffic totalled 214,000 tons, the largest item being rice, which provided just over one-quarter of the total. Petroleum and its products, from the oilfields at the southern end of the line, made up an appreciable traffic, but the remainder consisted largely of agricultural and forest produce, notably palm nuts and palm oil, areca nuts, rubber, timber and timber products (including resin and turpentine from the pine forests of the mountains around Takingeun), fibres and sugar.

The headquarters and workshops of the Atjeh railway are at Sigli. The shops dealt in 1940 with 24 locomotives (12 for heavy repairs), 67 carriages and 352 wagons.

COMPARISON BETWEEN THE STATE RAILWAYS OF JAVA AND SUMATRA.

In order to afford some measure of comparison between the three State-owned railways of Sumatra, the following table is added, giving comparable figures for the Java S.S. also, for the year 1940.

Railway	Passengers (millions)	Passenger-miles per mile of line (thousands)	Freight (thousand tons)	Freight-miles per mile of line (thousands)
Z.S.S.	2.10	176	1,013	254
S.S.S.	3.32	226	876	331
A.S.S.	3.17	130	206	42
J.S.S.	37.27	380	4,436	172

Source: State Railway annual report for 1940 (Batavia, 1941).

'Passenger-miles per mile of line' and the equivalent freight figure are useful measures of the comparative intensity of utilization of the railways to which they relate. Clearly, and as might be expected, the intensity of the passenger traffic is far greater in Java than in Sumatra, and in the latter it is least in the Atjeh region and greatest in the densely-peopled Padang Highlands.

The intensity of freight traffic on two of the Sumatra lines is entirely due to the importance of long distance coal traffic in each case.

It is natural that on the two coal-carrying lines the locomotives should burn coal. Consumption in 1937 was 23,000 tons on the South-Sumatra lines and 28,000 tons on the West-Sumatra lines. The Atjeh railway uses wood fuel; the amount in 1937 was 14,000 tons. Comparable figures for the Java State railways were 264,000 tons of coal.



Plate 116. West-Sumatra line in the Anaikloof

Rack-and-pinion section of the line, at one of the numerous crossings of the Anai river (Fig. 115).



Fig. 117. West-Sumatra line alongside lake Singkarak

Mixed train of coal hoppers and passenger coaches, hauled by two tank engines, crossing the mouth of the Oembilin river on the eastern shore of lake Singkarak (Fig. 115). The line is paralleled by the main road through the Padang Highlands.



Plate 118. Deli Railway at Medan

Medan station, with passenger train hauled by 2-6-4T at platform. Note the large pile of wood fuel for locomotives on the left.

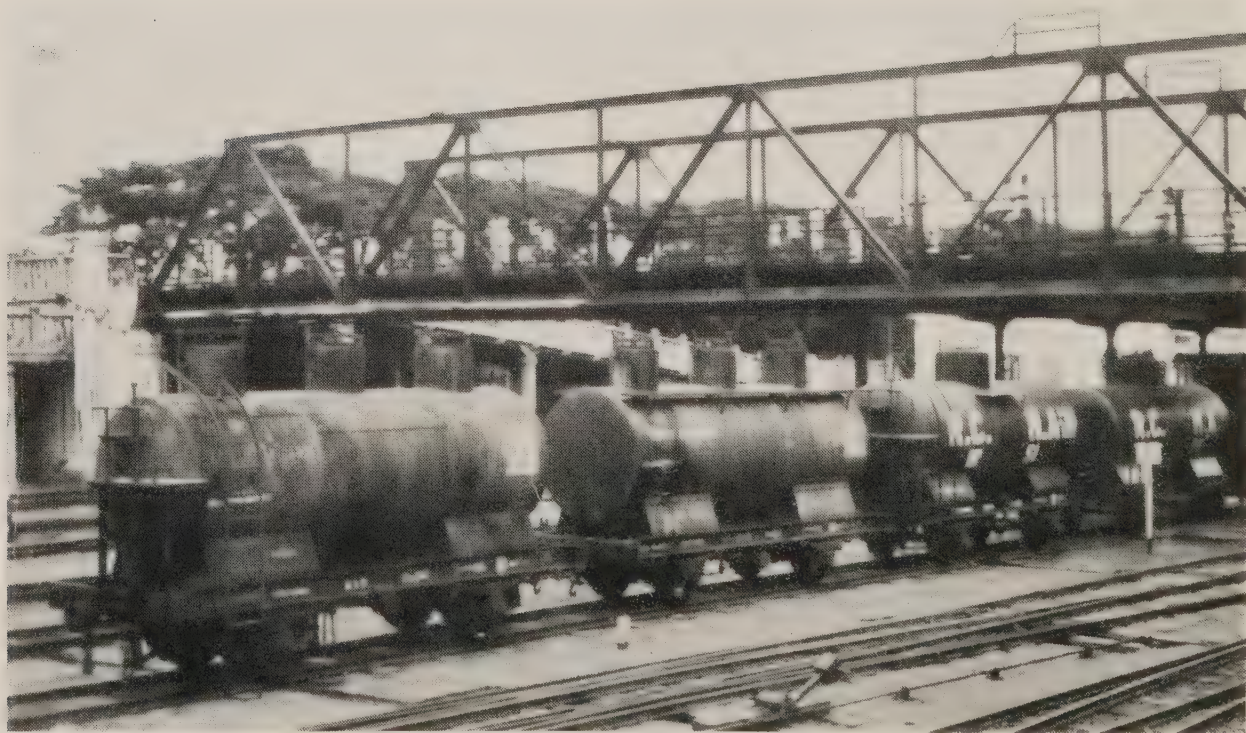


Plate 119. Tank wagons at Medan, Deli Railway

Special wagons for collecting latex from rubber plantations.

COMPANY RAILWAYS

Deli Railway

The Deli Railway company has its head office in Amsterdam and a local head office in Medan. The system comprises a first-class main line from Belawan via Medan and Tebingtinggi to Tandjoengbalai, with a branch from Tebingtinggi to Pematangsiantar, and a number of second-class branches or steam-tramways, including a long one at the northern end, to Pangkalanbrandan and Pangkalansoesoe, a long one at the southern end, to Rantauparapat, and several in the tobacco-growing area west and south of Medan (Plates 118, 119).

A very large proportion of the mileage runs through plantations of one kind or another, and the carriage of the produce is the main function of the railway, freight traffic (for which no commodity details are available) accounting for some 85-90% of the total receipts. In 1937 the line carried 4.5 million passengers and 880,000 tons of freight. The line is a highly profitable concern; the operating expenditure in 1938 was only £ 2.2 million compared with a revenue of £ 5 million.

The rolling stock of the Deli Railway is of high quality, Tank locomotives are exclusively employed, the 2-4-2 and 2-6-4 types being dominant. All the steam locomotives burn wood fuel, the consumption of which in 1937 was 53,000 tons. There are some oil-burning railcars.

BIBLIOGRAPHICAL NOTE

1. There is very little literature in the English language on the railways, and this chapter has been pieced together from a variety of sources.

The principal source of statistical information is the annual report of the State Railways—*Staatspoorwegen in Nederlandsch-Indië: Verslag over het jaar, 1940* (Batavia, 1941). The annual *Indisch Verslag*, published at Batavia, contains summary statistics for both State and company lines.

2. Short articles appeared in the *Railway Gazette* (London), April 19th, 1942, and in *Modern Transport* (London), Jan. 24th, 1942.

There are some notes on company railways in Java in H. M. de Vries, *The importance of Java seen from the air* (Batavia, 1928).

Chapter XVI

SEA COMMUNICATIONS

Introduction: Inter-island Communications: External Communications: Tanker Fleet: Government Marine: Native Trading Craft: Bibliographical Note

INTRODUCTION

The Malacca strait is the main gateway on the sea routes linking India and the West with the Far East and Australia, and is therefore one of the most important channels of world traffic. Penang and Singapore on the Malayan side of the strait are the chief ports of call, and few liners, except vessels under the Dutch flag, touch at ports in Sumatra. Ships of many nations, however, call at ports along the north coast of Java on their way to or from Australia.

Java is the centre of local traffic within the archipelago. Both for administrative and commercial purposes it is necessary to ensure regular communications with the innumerable islands that compose the Dutch empire in the East, and the necessary provision is made by subsidies to private enterprise, and by the Government Marine Service.

It is only within quite recent years that the Dutch have taken a leading part in maritime traffic. In 1842 the firm of William Ruys despatched a vessel from Rotterdam to Batavia and in subsequent years enlarged its fleet. Mails and passengers were also brought to Singapore in British liners, and thence transferred into the vessels of the Netherlands Steam Navigation Co., owned by the British India Steam Navigation Co., but sailing under the Dutch flag. Another company trading with Java was that of Alfred Holt, who opened the Blue Funnel line with one ship in 1852. In 1865 he founded the Ocean Steamship Co. to trade with the East round the Cape of Good Hope. When, almost simultaneously, the Suez Canal was opened, the restrictions on the sugar trade removed and differential duties abolished, the slow Dutch vessels had to face the competition of modern steamships which from 1870 used the canal. In 1870 the Ruys firm decided to substitute steam for sail; in 1875 it took a leading part in forming a combination of small shipowners, known as the Rotterdam-Lloyd Steamship Association, which in 1883 was

converted into the *Rotterdamsche-Lloyd Mij.* The adoption of a more progressive policy by the Ruys firm in 1870 was due not merely to the competition of foreign steamers, but also to the threat of competition within the Netherlands. Prince Henry, a brother of the king, who had long shown a keen interest in the economic development of the Netherlands Indies, encouraged the formation of the *Nederland Stoomvaart Mij.* to trade with the East by way of the Suez Canal. For some years, however, the new company had to buy its ships abroad and hire foreigners to run them. Against the *Rotterdamsche-Lloyd* it had an advantage as it secured most of the government cargo, but both companies had an uphill struggle against the strong British shipping interests. In 1891 the Ocean Steamship Co. formed a line to Java under the Dutch flag, known as the *Nederlandsche Oceaan Stoomvaart Mij.* In 1892 the Dutch firms agreed to co-operate and to divide the trade, but it was not until the fortunes of the Netherlands Indies took a turn for the better during the present century that they began to prosper.

The Dutch were equally backward in local shipping within the archipelago, and for the same reason. By 1870 the archipelago was thronged with small steamers, but these were almost all under the British flag, and the vessels sailing under the Dutch flag were often British owned. The whole traffic was dominated by the Netherlands Steam Navigation Co. which held the contract with the government of the Netherlands Indies for the carriage of mails and passengers. In 1888 the *Rotterdamsche-Lloyd* and *Nederland Stoomvaart Mij.* arranged with the government for the formation of a local company, the *Koninklijke Paketvaart Mij.* (K.P.M.), and in 1891 when the contract with the *Nederland Stoomvaart Mij.* expired, the concession was transferred to this new company.

Since then these three companies in mutual association have extended their operations over the whole world. In 1902 the two parent companies established the *Java-China-Japan Lijn* to open up communications under the Dutch flag with the Philippines, Indo-China, China and Japan. In 1908 they opened a line connecting Java with Bengal, and later extended it to the west coast of the United States. In the same year, in combination with the K.P.M., they consolidated their interests by founding the *Nederlandsche Scheepvaarts Unie* to promote their mutual aims. In 1915 the *Rotterdamsche-Lloyd* opened a line to the east coast of the United States. The Dutch companies are also associated with the *Nederlandsche Oceaan Stoomvaart Mij.*, the Dutch branch of the Holt or Blue Funnel line,

and also with the Silver Line, in trading with America, Africa and the Pacific, and the K.P.M. has developed connections with Australia.

In external communications the two leading Dutch firms, both subsidized by the government, take the foremost place but have to face strong competition with the ships of all nations. Within Dutch waters, the K.P.M., also subsidized by the government, is supreme; this is partly due to the closing of many small ports to foreign vessels on political grounds (see p. 468). The numerous small steamers and thousands of native craft are feeders of the K.P.M. rather than competitors.

Further information about the Dutch mercantile marine, which includes the Dutch-owned vessels operating in the Netherlands Indies, is given in N.I.D. Handbook on the *Netherlands*.

INTER-ISLAND COMMUNICATIONS

The *Koninklijke Paketvaart Mij.* (K.P.M.) carries practically all the inter-island traffic, apart from a small amount carried by native craft and a few small steamers, mostly owned by Chinese. Its services, maintained by about 150 ships, to a large extent take the place of railways and roads in a continent, and also provide communication with many other countries (Plate 121).

The K.P.M. works in close conjunction with the Netherlands Indies government, the relations between the two being regulated by periodical contracts. The current contract runs from 1931 to 1945; the following are the main articles: (i) The company undertakes to maintain specified services within the local waters, and further to ply over an additional one and a half million miles a year within local waters and to Singapore, Penang and Portuguese Timor. (ii) The payment for mail services is to be proportional to the mails carried, at rates as shall from time to time be approved. (iii) The government undertakes to pay a subsidy of £ 200,000 a year in addition to payments made for services rendered, and can demand additional service on payment of an agreed increase of the subsidy. (iv) The company is to arrange the tariff for private passengers and freight in consultation with the government, and government passengers and goods will be carried at reduced rates. (v) The agreement also contains particulars as to the size of ships, sailing days, and prescribes that the government shall have a preference for ship space, while on the other hand the government undertakes to employ no other company on its business. (vi) There is also a clause to ensure the national character

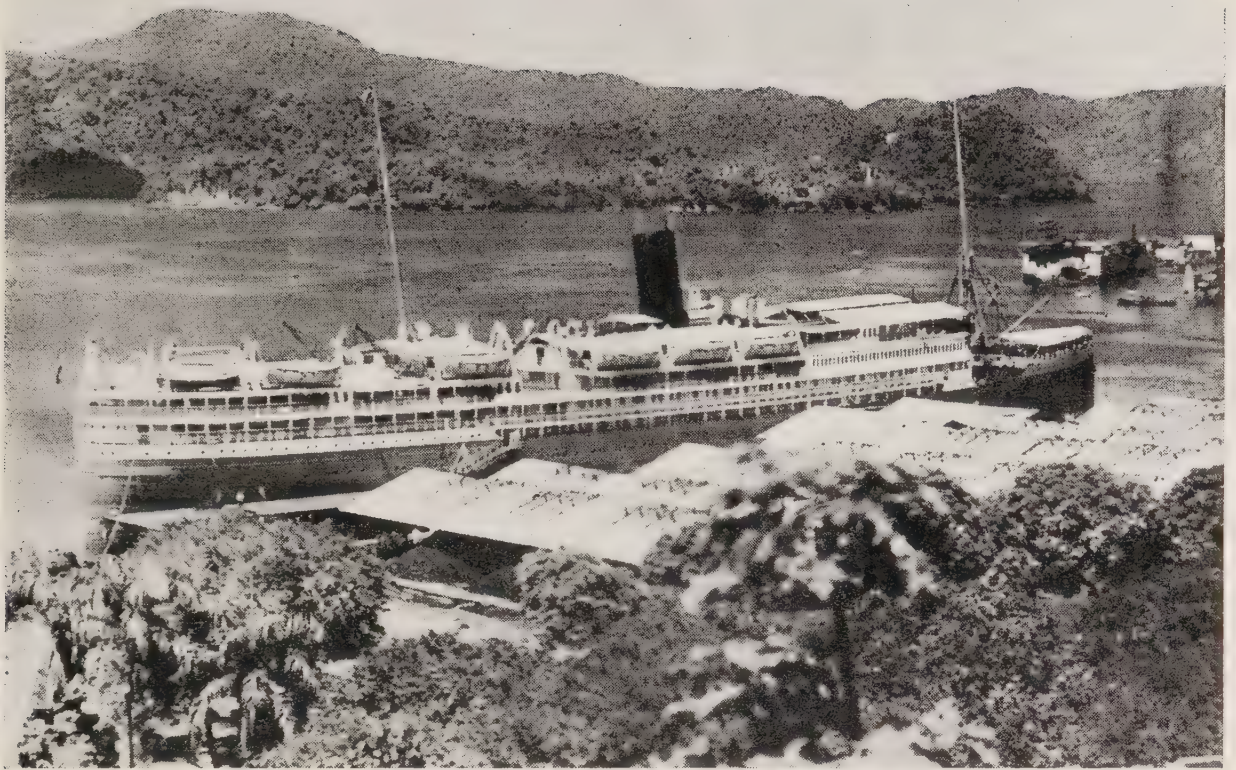


Plate 120. Steamer of the *Rotterdamsche-Lloyd* line at Sabang

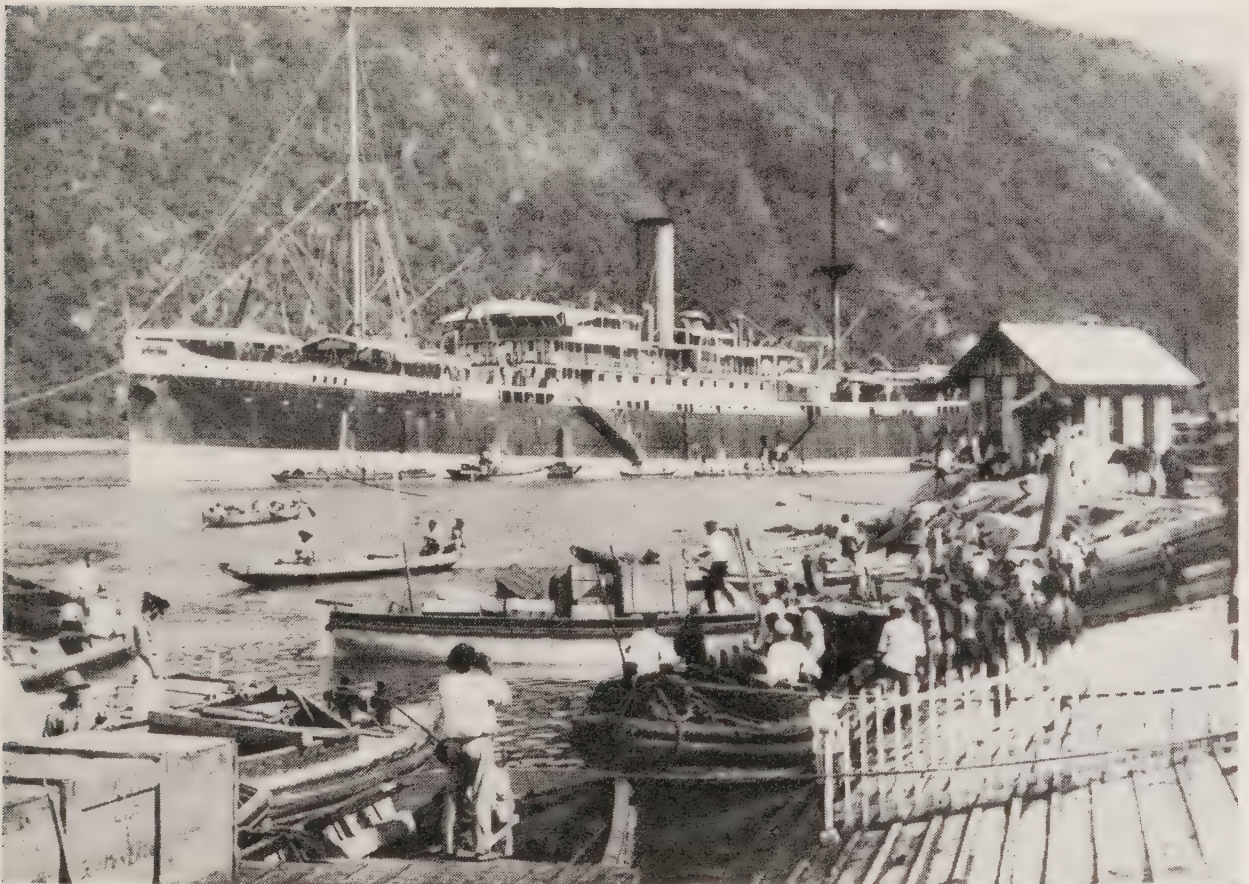


Plate 121. Steamer of the K.P.M. line at Gorontalo

This ship is typical of the large number of ships of this company which trades in the Netherlands Indies.



Fig. 118. External sea-communications
 Source: *Atlas van Tropisch Nederland*, plate 1 (Batavia, 1938)

of the ships and conferring on the government a right to take them over.

About sixty-eight regular lines are operated, connecting all the islands of the archipelago at least once a month. The chief services and principal ports of call are shown in Fig. 117 which also gives an indication of the frequency of each service. The great majority of the vessels engaged in inter-island trade are under 4,000 tons gross, though a few of the more modern are of from 5 to 6,000 tons. About a third of the fleet consists of motor vessels. In 1939, 38% of the ships owned by the K.P.M. were more than fifteen years old, 51% were between five and fifteen years old and only 11% were less than five years old.

EXTERNAL COMMUNICATIONS

Services to Asia

The K.P.M., in addition to its 'local' services to Singapore and Penang, maintains services to China, Indo-China, Siam and Burma. Vessels run fortnightly to China and Rangoon from Belawan, and monthly to Indo-China and Siam, with sailings from Java and Celebes.

The *Java-China-Japan Lijn* is the principal Dutch line trading in the Far East, with sailings from ports in Java, Sumatra, Celebes and Borneo via Manila to Hong Kong, Amoy, Shanghai and several Japanese ports. The company has seven passenger ships, two motor vessels of 9,200 tons and five steamers of 5,800 to 9,500 tons; there are in addition four cargo ships. The *Nanyo Kaiwen Kaisya*, a Japanese line, is the chief competitor of the Dutch line, with ships running between Japan, China, the Straits Settlements and Java ports. The Australian line of the *Nippon Yusen Kaisya* calls at Manado and provides a service between Celebes and Japan as well as Australia. The *Osaka Syosyen Kabusiki Kaisya* also has a service from Japan to Java.

The British India Steam Navigation Company's Calcutta-Australia service calls at Java ports when inducement offers. The Straits Shipping Co., run in connection with the Blue Funnel line, provides a service between Singapore, Penang and the east coast of Sumatra. It has a fleet of twenty-seven ships up to 2,000 tons. The Silver Line (S. & J. Thompson) maintains a service from United States ports to Java and thence to Calcutta. The Silver Line, Dodwell-Castle and Barber Lines, and the Bank Line also run services which call at ports in the Netherlands Indies and various parts of Asia.

Services to Australia and the South Pacific

The K.P.M. maintains two services monthly to Australia, one direct from Java to Brisbane and the chief ports southwards to Adelaide and the other to Sydney via New Guinea, certain Pacific islands, and New Zealand.

The Ocean Steamship Co. (Alfred Holt) runs a fortnightly service from Singapore to Java and Australian ports from Derby southwards to Fremantle. The government of Western Australia also maintains a service from Fremantle to Java with two motor vessels of about 4,000 tons. The Burns Philp Line, an Australian firm, runs a monthly service from Melbourne to Singapore calling at Java ports.

Services to Africa

The K.P.M. runs a monthly service from Java to the east coast of Africa and Cape Town, calling at Mauritius and Réunion among other places. The majority of the vessels on this service start from Hong Kong and call at Manila, Saigon, Bangkok and Singapore outward. On the homeward run, calls are made at Durban, Mauritius, Réunion, Zanzibar, Mombasa, Belawan, Singapore, Hong Kong and Shanghai. This service is maintained by three vessels of about 14,000 tons and four others of about 5,000 tons.

Additional services to Africa are provided by ships of the Java-New York line and the Silver Line.

Services to America and Round-the-World Services

The *Nederland Stoomvaart Mij.*, in conjunction with the *Rotterdamsche-Lloyd* and the Blue Funnel Line, runs a service from Java to New York via Cape Town with sailings about once a week. The *Nederland Stoomvaart Mij.* provides regular communication with the west coast of the United States. Another service on this route is that run jointly by the Silver Line and the *Rotterdamsche-Lloyd*, with two or three sailings a month. The Klaveness Line, the vessels of which have accommodation for eight to twelve passengers each, runs a monthly service between Sumatra and Java and ports on the west coast of the United States via Manila and Hong Kong. The Indian-Chilean service of the Bank Line runs from Calcutta, Rangoon and Java to ports on the west coast of South America.

Other lines, which connect the United States and the Netherlands Indies, are the round-the-world services of the Barber and Dodwell-Castle Lines, the Silver-Java-Pacific Line, the Silver Line-Prince Line and the Blue Funnel Line. The following routes are typical of these services: Barber-Dodwell Castle Lines—east coast of the

United States, Panama Canal, west coast of the United States, Manila, Shanghai, Japan, Manila, Makassar, Java, Singapore, Penang and the east coast of the United States via the Suez Canal. Silver-Java-Pacific Line—west and east coasts of the United States, Cape Town, east coast of Africa, Calcutta, Rangoon, Belawan, Singapore, Java, Manila and west coast of the United States. Silver Line-Prince Line—east and west coasts of the United States, Manila, Shanghai, Hong Kong, Manila, Makassar, Java, Singapore, Belawan, Penang, Colombo, Dakar and east coast of the United States.

Services to Europe

The ordinary service for mails and passengers between Europe and the Netherlands Indies is maintained by the *Rotterdamsche-Lloyd* and *Nederland Stoomvaart Mij.* acting in co-operation and sailing in alternate weeks. The former calls at Southampton, Tangier, Marseilles, Port Said, Colombo, Sabang, Belawan, Singapore, Tandjoengpriok, Semarang and Soerabaja; the latter, at Southampton, Algiers, Genoa, Suez and thence as above. Occasional vessels call at Odessa on the homeward run. The same two lines maintain a regular cargo service. The *Rotterdamsche-Lloyd* runs between the Netherlands, Hamburg, Bremen, Antwerp, London, Southampton and Genoa and the principal ports in the Netherlands Indies, and on the homeward journey to Colombo, Suez, Port Said, Trieste, Marseilles, Barcelona, Le Havre, Liverpool, London, Dutch ports, Hamburg and Bremen, and calls at other ports on the line of route if necessary. The cargo boats of the *Nederland Stoomvaart Mij.* call regularly at Hamburg, Bremen, Antwerp, London and Genoa and all the chief ports in the Netherlands Indies. Both these lines have contracts with the government for the carriage of mails and official passengers, and of government produce shipped to the Netherlands.

The *Nederlandsche Oceaan Stoomvaart Mij.* maintains a regular freight service between Europe and the Netherlands Indies.

Among foreign companies maintaining a direct service between the Netherlands Indies and Europe, the most important is the *Hamburg-Amerika* line, which includes the German-Australia line, and the Hugo Stinnes lines. The direct service from Hamburg, running every six weeks, calls at Antwerp, and goes by way of the Suez Canal to Makassar, Sabang, Tandjoengpriok, Cheribon and Semarang, to Soerabaja. This company shares the bulk of the European cargo traffic with the three Dutch companies mentioned above. The *Norddeutscher-Lloyd* ships call at Belawan on their way

back from China. The Danish *Östasiatiska Kompagni* runs from Copenhagen via the Suez Canal to Java ports.

Among the cargo lines calling irregularly, two of the most important are the Blue Funnel Line and the Ellerman Bucknall Line. It was also possible to travel to or from Europe by transshipment at Singapore or in India on to the vessels of the Peninsular and Oriental Co., the *Messageries Maritimes* and other large companies.

TANKER FLEET

La Corona Petroleum Mij., a subsidiary of the Anglo-Saxon Petroleum Co., owns thirty-five tankers of 800–9,600 tons which are employed in carrying petroleum from the Netherlands Indies to the Netherlands. Other subsidiaries of the Anglo-Saxon Petroleum Co. employed in the Netherlands Indies are the *Nederlandsche-Indische Tankstoomboot Mij.* and the *Nederlandsche Nieuw Guinee Petroleum Mij.* The former company has a fleet of about twenty-five vessels, a few of which are small (200–300 tons) but the majority ranging between 2,000 and 7,000 tons. The latter runs three small vessels of 164–340 tons. The majority of the tankers are motor vessels and about half were less than five years old in 1939.

GOVERNMENT MARINE

Besides subsidizing private lines, the government maintains a flotilla known as the Government Marine. Formerly this was a semi-military force (hence popularly known as *Setongak Kompenie* the 'half-and-half'), but it has been purely a civil organization since 1898, though some of the boats are armed for purposes of police. The duties of the Marine are the transport of government officials and goods so far as necessary, police supervision within territorial waters, the suppression of slavery, and the rendering of such other services as may be deemed expedient. The boats fall into two categories: those at the service of the central government, and those allotted to the various maritime residences for local service.

At the end of 1937 there were fifteen ships at the service of the central government, of which two were specially intended for the supervision of buoys and coastal lights. The provincial service comprised 47 motor-boats, 70 motor-vessels, 20 steamboats, 44 sailing ships, and 3 stern-wheelers.

NATIVE TRADING CRAFT

There are numbers of native trading craft engaged in local and inter-island commerce some of which are of European design. The chief types are Makassar trading praus (Fig. 119), Madoera trading praus and schooners, ketches and sloops.



Fig. 119. Madoera trading prau

Drawn from a photograph.

Makassar trading praus are ketch- or sloop-rigged with tripod masts, long bowsprit and high, overhanging stern; they are based on Makassar and other ports of south Celebes, from which they trade throughout the area from Singapore to north-west New Guinea. The main trading season is from April to November inclusive.

Madoera trading praus have one or two modified lateen sails and a prominent deck house of bamboo and matting amidships. They

are based mainly on the ports of eastern Java, Madoera and Bali and trade in about the same area as the Makassar type.

Schooners, ketches and sloops of European design, some of the larger of which have auxiliary engines, are in use throughout the Netherlands Indies but are particularly common in the Lesser Soenda islands.

BIBLIOGRAPHICAL NOTE

Details of ships, lines and services are given in E. C. Talbot-Booth, *Merchant Ships*, 1940 (London, 1940) and in the *Directory of Shipowners, Shipbuilders and Marine Engineers* (London, 1942). Additional information may be obtained from sailing lists and time-tables.

Appendix I

HINDUISM, BUDDHISM AND ISLAM

HINDUISM

Hinduism is the religion of the great bulk of the inhabitants of India at the present time and was formerly the religion of Java, Sumatra and Bali; in the latter island, it still persists in a modified form. Hinduism provides an ethical and moral code as well as purely religious beliefs, and it also regulates, in many respects, social institutions such as marriage; it is therefore, difficult to describe it briefly. There are a number of major gods, but in general either Vishnu or Siva is the object of supreme adoration. In the Netherlands Indies Sivaism was the popular form, the worship of Vishnu and other lesser deities being relatively unimportant. Siva is regarded as a mystic, miracle-working deity and also as a blood-loving awe-inspiring god; these different aspects or manifestations appealed to different sections of the population. The pantheon of Hinduism includes a host of minor deities of diverse origin which are in the main accepted by both Vishnuites and Sivaïtes.

The main tenets of Hinduism are *karma*, *samsara* and *moksha*. The first is literally an 'act' or 'deed', and means the verdict on the kind of life which a man has led and also the fate which caused him to live in that way. *Samsara* is the belief in reincarnation, the ceaseless moving through various existences and the continual cycle of birth and death. The form of each new incarnation is thought to depend on the *karma* of the previous one. The belief in *samsara* and the continuity of sorrow and suffering in life leads in turn to the belief in *moksha*, which is the final release from the cycle and absorption in the infinite which is the eventual reward of a virtuous existence.

BUDDHISM

Buddhism was founded by Siddhartha Gautama, who was born of a princely line in northern India about 560 B.C. The title 'Buddha', which he acquired later, means 'the Awakened' or 'the Enlightened'.

Buddha accepted much of the beliefs and thoughts of Hinduism, but gave them a profounder meaning than they had previously had. The Hindu belief that existence is suffering is the starting point of Buddhism. This suffering manifests itself as sorrow (*dukkha*), transitoriness (*anicca*) and unreality (*anatta*). All human effort consists of a vain attempt to cleave to the transitory and unreal things of the world. Man is no more permanent than the other unreal phenomena in the world and contains no imperishable substratum or soul. Nevertheless the Buddha postulated a reincarnation, the new existence being connected with the former life much as an effect is connected with its cause. Modified in this way the idea of *karma* is adopted from Hinduism. Similarly, the idea of *Nirvana*, the final release, is derived from Hinduism. The method of attaining *Nirvana* is by abstention from desire, a complete renunciation of all earthly things and devotion to contemplation.

Original Buddhism had no room for a deity and the gods of Hinduism were, to Buddhists, no more than happier kinds of existence, the reward of a good *karma*.

Mahayana, or 'Greater Vehicle', Buddhism, which arose at a later date, has a speculative form of theism starting from the thought that the emergence of an earthly Buddha has a hidden background in eternity. Out of this belief arises the doctrine of the *trikaya*, the 'Triple Body' or Trinity. The background of it is the

bodhi, the 'knowledge', the attainment of which made Gautama the Buddha. In the Mahayana the *bodhi* manifests itself in a threefold body consisting of the eternal element which lies behind the transitory appearance of empirical existence, the manifestation of this, for instance, in the historical Buddha, and the power of the blessing which resides in the *bodhi*.

The peculiar creation of Mahayana Buddhism is the *bodhisattva*, which is the stage through which Gautama and a very large number of enlightened men following his teaching passed before becoming Buddha. Those who came after Gautama stopped at the stage of *bodhisattva* because they were filled with infinite pity for the suffering world. These *bodhisattva* are energetic beings bent on alleviating all actual suffering, bodily and spiritual. Thus the ideal of achieving *Nirvana* was replaced by this new ideal of unwearied labour in the cause of all who suffer.

Hinayana (or 'Lesser Vehicle'), the other great branch of Buddhism, has kept close to the original ideas of the Buddha and seeks *Nirvana* through a complete renunciation of life which may be obtained by virtue and contemplation.

Mahayana is, at the present day, the northern branch of Buddhism and uses Sanskrit, while Hinayana, the branch found in Ceylon and other southern Buddhist countries, uses Pali. The few Buddhists remaining in the Netherlands Indies belong to the Hinayana branch.

ISLAM

The Muslim religion was founded by Mohammed, who lived c. A.D. 571-632. The sacred book of the faith, the Koran, was compiled during the life of the Prophet, who, however, is not known himself to have written anything. It contained a considerable body of unreliable tradition, often involving contradictory statements, and was extensively purged by Mohammed's successors.

The original creed of Islam, which incorporates many elements from Judaism and Christianity, was a synthesis by Mohammed on the basis of his belief in monotheism but his refusal to accept the divinity of Christ, who was regarded as one of a series of prophets of whom Mohammed was the most recent and, therefore, the greatest. The basic creed of Islam is simple, 'There is no God but God, and Mohammed is the Prophet of God'. The principal laws governing the behaviour of Muslims are: they must pray to Allah five times a day, they must keep Friday as the Sabbath, they must fast during the month of Ramadan from sunrise to sunset, and they should, if circumstances permit, make a pilgrimage to Mecca at least once in a lifetime. They must also give alms for the support of the faithful poor. Islam permits polygamy, though Mohammed recommended that no man should have more than four wives; it also encourages believers to proselytize those of other faiths. The Muslims of the Netherlands Indies belong to the Sunnite sect. *Sunna* came to mean whatever had been done or approved by the Prophet and his companions, and by the first generation of the faithful. The accepted account of their words, conduct and desires constitutes the contents of the tradition known as *Hadith*. The Sunnites contend that where the Koran does not give clear guidance, the *Hadith* should be followed. The other main sect, the Shi'ahs, prefer to use reason, rather than tradition, in dealing with a new situation which is not provided for by the Koran. Mysticism (*sufi*) has played a great part in the development of Islam in the Netherlands Indies.

In addition to providing a religious ritual and beliefs, Islam also provides a code of laws (*sharia*), laying down rules for marriage, inheritance and the conduct of men towards one another.

Appendix II

CHIEF TOWNS AND CITIES

In 1930 there were seven towns in the Netherlands Indies with a population of over 100,000 and ten towns with a population of from 50,000 to 100,000 (Fig. 23). Twelve of these towns are in Java and five in the Outer Provinces. Only the inland towns are described in the following account as the seaports are dealt with elsewhere (see chapter XIII *passim*). All the population figures refer to the year 1930.

BANDJERMASIN (pop. 65,698); see p. 387.

BANDOENG (pop. 166,815)

Bandoeng is the largest town in the interior of western Java and the capital of the Preanger Residency. It lies about 2,300 ft. above sea-level in an ancient lake basin drained by the Tjitaroem river and surrounded by a ring of volcanoes. When Bandoeng was founded by the sultan of Cheribon in the early seventeenth century, the site selected was on the banks of the Tjitaroem. In 1810 Daendels removed the town to its present site north of the river. Until the opening of the railway from Batavia in 1906 the town remained small and insignificant, but since then, and more particularly during the last two decades, it has increased rapidly both in size and importance. In the ten years between 1920 and 1930 the population increased by over 80%.

With its healthy climate, many open spaces, well-built houses and beautiful natural surroundings Bandoeng is one of the most attractive of the towns of Java. It has a number of fine hotels, two hospitals, a theatre, several cinemas and a race-course. The town has also a Pasteur Institute, a Government Vaccination Institution, and a Technical College; its industries include a cinchona factory and the chief workshops of the State Railways. Several government departments, those of War, Public Works and Public Industries, have their offices in the town. Bandoeng is the seat of a resident and of a native regent; it is also the headquarters of the army in the Netherlands Indies (Plate 122).

The main railway line which runs from the west to the east of Java passes through Bandoeng. A number of good roads centre on the town from Batavia, Cheribon and Poerwakerta. Two miles north-west of the town is an aerodrome used by the *Koninklijke Nederlandsch-Indische Luchtvaart Maatschappij* (K.N.I.L.M.).

BATAVIA (pop. 533,015); see p. 347.

BUITENZORG (pop. 65,431)

Buitenzorg lies on the Tjiliwoeng river, twenty-seven miles south of Batavia. To the south of the town is the Benda gap, which forms a breach in the line of volcanoes and provides communication with the plains around Soekaboemi and Bandoeng. Since its foundation in 1745, the town has been the main seat of the Governor-General for, lying 860 ft. above sea-level, it has a more healthy and invigorating climate than Batavia, though Batavia still remains the administrative capital. The palace of the Governor-General is in the southern part of the town adjoining the world-famed botanical gardens. These gardens contain a great variety of tropical plants and there are also on the site many research laboratories and the

offices of the Department of Agriculture, Industry and Commerce. Near the entrance to the botanical gardens is a fine zoological museum (Plate 26).

There is railway and road connection from Buitenzorg to Batavia and to the chief centres in the interior of Java. Two good roads lead to Bandoeng, the first a rather circuitous route by way of the Benda gap and Soekaboemi; the second, a more direct, though harder, route across the northern slopes of G. Pangrango.

CHERIBON (pop. 54,079); see p. 349.

JOGJAKARTA (pop. 136,649)

Jogjakarta, the capital of the native principality of the same name, is situated in the centre of a densely peopled plain south of the active volcano G. Merapi. It is one of the few towns in Java where the old native customs and ceremonies are retained. The most striking of the buildings in the town is the Kraton or palace of the sultan. It covers an area of nearly a mile square in the southern part of the town, and is surrounded by a wall almost 11 ft. high and 12 ft. thick. Other interesting buildings are the palace of Prince Pakoe Alam, the residence of the Dutch governor, and the old Dutch stronghold of Fort Rustenburg (Plate 123).

Agricultural products, especially tobacco and sugar-cane, are brought to Jogjakarta from the intensively cultivated plains in the neighbourhood. Jogjakarta is an important distributing centre for these products; its market is famed throughout Java. It is also a centre for native handicraft industries, such as batik-working, copper-smelting and tortoise-shell manufacture.

Jogjakarta is connected by rail and road with Bandoeng and Batavia on the west and with Soerakarta and Soerabaja on the east. In addition, there is a railway line and a road running north to Magelang and Semarang.

KOEDOES (pop. 54,524)

Koedoes is a market town on the northern coastal plain of Java, about forty miles north-east of Semarang. It is built on the banks of a small stream, the Kali Gelis, which rises on the conical-shaped volcano of G. Moerjo to the north of the town. Koedoes is the seat of a native regent.

A steam-tramway connects Koedoes with Semarang and with Rembang. There is also a good motor road to these places.

MAGELANG (pop. 52,944)

Magelang is an important town in the broad valley of the upper Kali Progo. To the west of the town rises G. Soembang (11,060 ft.), one of the highest volcanoes in Java, and to the east, on the other side of the valley, are seen the shapely volcanoes of G. Merbaboe (10,308 ft.) and G. Merapi (9,550 ft.). About ten miles south of Magelang are the famous ruins of Boroboedoer, the most striking and well preserved of the Buddhist *stupa* in Java (see pp. 12, 41).

The town has had a long and varied history. It was one of the chief towns in the Mataram kingdom and today is the capital of the Kedoe Residency. It is linked by road and rail with Jogjakarta and Semarang.

MALANG (pop. 86,646)

Malang lies at a height of about 1,250 ft. above sea-level on the banks of the upper Kali Brantas in eastern Java. It is the seat of a residency and of a native regent. The town is well laid out and has a number of fine public buildings (Plate 124). Malang is the centre of a richly productive agricultural region; many coffee plantations clothe the slopes of the mountains which surround the town.

A railway runs from Malang to Kediri in the middle Brantas valley and to Soerabaja on Madoera strait. Good roads cross the mountains to the north and north-west of the town.

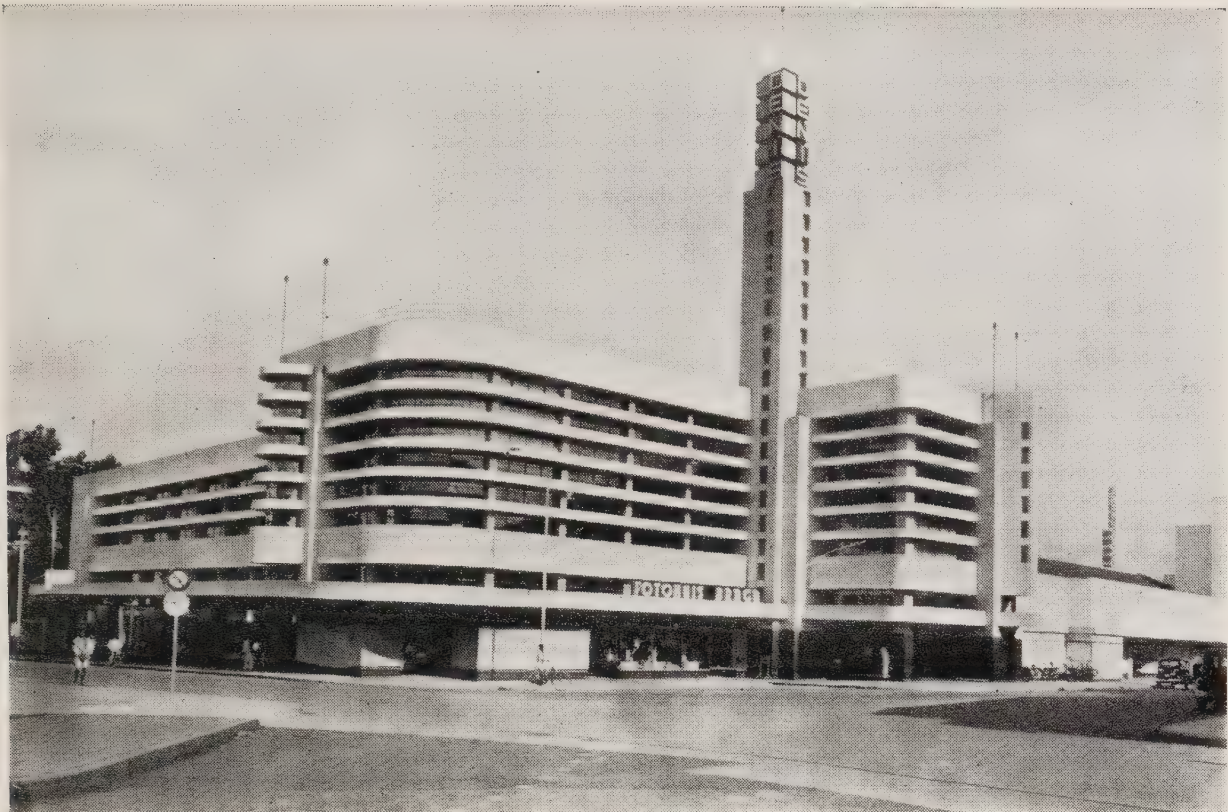


Plate 122. Bandoeng: modern shopping centre

A number of modern buildings of this kind have been erected in Bandoeng during recent years.



Plate 123. Jogjakarta: the main street



Plate 124. Malang



Plate 125. Medan

The photograph shows the main north-south road through the town. On the left is the Hotel de Boer and on the right the post and telegraph office.

MAKASSAR (pop. 84,555); see pp. 392-4.

MEDAN (pop. 76,584)

Excluding the ports, Medan is the only town in the Outer Provinces with a population of over 50,000. It stands about fifteen miles from the sea on the banks of the S. Deli in north-eastern Sumatra. Medan is the capital of Sumatra, the seat of the governor of the Oostkust Residency and the residence of the sultan of the native state of Deli. Among the many imposing buildings are the palace of the sultan, the palace of the governor, the Town Hall and the Court of Justice (Plate 125).

Medan has risen to importance since 1870 with the establishment and extension of plantation agriculture on the neighbouring coastal plain and mountain slopes. This plantation region (*cultuurgebied*), of which Medan is the main centre, is the largest producer of tobacco, rubber and coconuts in Sumatra. These crops and many others are first sent to Medan and then despatched to the port of Belawan for shipment overseas. Medan is connected by road and railway with Belawan at the mouth of the S. Deli and with the other chief centres of the coastal plain. A motor road runs inland over the hills to lake Toba on the Batak plateau. There is an aerodrome used by the K.N.I.L.M. a little to the south of the town.

PADANG (pop. 52,054); see p. 383.

PALEMBANG (pop. 108,145); see p. 378.

PEKALONGAN (pop. 65,982); see p. 351.

SEMARANG (pop. 217,796); see p. 353.

SOERABAJA (pop. 341,675); see p. 357.

SOERAKARTA (pop. 165,484)

Soerakarta, the capital of the sultanate of the same name, is built close to the banks of the upper Kali Solo where the river flows east of G. Merapi. Like Jogjakarta, it is a stronghold of native life and tradition.

The two native rulers, the Soesoehoenan or Sultan and Prince Mangkoe Negoro, adhere to the old Javanese ceremonies and each has his own palace. A Dutch governor also resides in Soerakarta. The streets of the town are broad and there are many tree-lined avenues.

Tobacco and sugar-cane are grown extensively in the neighbourhood of Soerakarta and a number of factories in the town prepare crops for export. There are also many native handicraft industries.

Soerakarta is an important centre of communications. Both railway and road converge on the town from Madioen in the east, Semarang in the north, Bojoali in the west and Jogjakarta in the south-west.

Appendix III

POSTS, TELEGRAPHS AND TELEPHONES

Postal, telegraph and telephone services are operated in the Netherlands Indies by the *Post-, Telegraaf- en Telefoon dienst*. Prior to the administrative redistribution of 1934, this was under the *Departement van Gouvernements Bedrijven* (Department of State Enterprises); after that date, it passed under the control of the *Departement van Verkeer en Waterstaat* (Communications and Public Works).

While these services are of course an essential utility, their operation is so effective that as a rule a profit results to the government; during the depression years of 1930-33, however, there was a deficit. The total credit balance is due almost entirely to the postal receipts; the telegraph service invariably and the telephone service frequently are worked at a loss, as shown in the following table:

Balance (+) or deficit (-) in 1,000 guilders

Year	Postal service	Telegraph service	Telephone service	Total
1925	+2,878.3	-2,849.9	+ 600.0	+ 628.4
1930	+2,897.5	-3,842.0	+ 729.5	- 215.0
1931	+2,500.0	-4,392.5	+ 334.8	-1,557.8
1932	+3,153.9	-4,271.6	- 493.7	-1,611.4
1933	+2,927.7	-2,663.7	-1,096.2	- 832.2
1934	+3,703.3	-1,664.4	-1,174.8	+ 864.1
1935	+4,000.3	-1,321.1	- 329.0	+2,350.2
1936	+4,079.7	-1,230.0	- 263.5	+2,586.2
1937	+4,253.4	- 384.6	+ 662.8	+4,531.6

Source: *Indisch Verslag*, 1938, vol. II, p. 414 (Batavia, 1938).

POSTAL SERVICES

A district postal system was in operation in Java prior to 1862. This had been introduced into Java by Daendels, when he established a service maintained by post-horses; each village along the route had to provide men and horses for the carriage of the mails, as well as an allotment towards the cost. In 1862, a regular government postal service was organized for most of the Netherlands Indies. In that year, regulations were issued for the government monopoly of the conveyance of mail, and a uniform postage rate was fixed for internal correspondence; the first stamps were issued in 1864. Other services gradually introduced were the inland postal money-order service in 1864, the foreign postal money-order service in 1876, the service for collecting receipts and bills of exchange in 1882, and the parcel post in 1893. In 1877, the Netherlands Indies announced its adhesion to the International Postal Union.

The development of the efficiency of the postal system was directly related to the improvement in communications. From the beginning, government and private railways were used as much as possible. In 1891, the 'ambulant' service was introduced by which mail, under the care of the train-guard, was conveyed to and from places without post offices, and since 1906 a mail bag changing apparatus has

been installed at a number of stations where express trains do not stop. Post-cars, pack-horses and mail-carriers are still used, while the 'district-post' was introduced to allow of the exchange of letters in remote parts where there were no post offices. The number of post offices has increased from 219 in 1900 to 657 in 1939; of the latter, 343 are in Java and Madoera. There were also more than 1,300 small sub-offices.

Inter-island postal services, apart from air mails, are maintained under contract by the *Koninklijke Paketvaart Maatschappij* (Royal Packet Navigation Company), which runs regular services between the principal ports. Auxiliary post offices have been established on several steamers to serve places without post offices. Private steamers are obliged to carry mails at a fixed rate. Prior to 1937, mails for Europe were carried by the *Nederland Stoomvaart Mij.* and by the *Rotterdamsche-Lloyd*; the usual time taken was twenty-four days from Batavia to Amsterdam. Since 1937, all European mail has been conveyed by air.

The working of the postal services in recent years is shown in the table below:

Year	Inland mails despatched (1,000)	Foreign mails despatched (1,000)	Foreign mails received (1,000)
1920	66,721	4,585	9,525
1930	93,801	6,950	16,808
1933	81,140	6,187	14,365
1934	81,618	5,773	13,653
1935	74,933	5,714	12,733
1936	79,764	5,760	11,579
1937	87,663	6,145	12,940

Source: *Indisch Verslag*, 1938, vol. II, pp. 406-8 (Batavia, 1938).

There are no statistics available for inland mails received.

Air Mails

In 1928, a daily air service for inland mails was established by the K.N.I.L.M. (see p. 466) between Batavia and Semarang and between Batavia and Bandoeng, while in the following year the service was extended between Batavia and Soerabaja. The following table summarizes the development of the inland air mail services in recent years;

Total inland air mail

	Ton-miles	Total mail (1,000)
1930	4,116	*
1931	12,278	*
1932	11,663	525
1933	12,055	538
1934	12,570	551
1935	11,670	537
1936	16,883	720
1937	12,427	628

* Not available.

Source: *Indisch Verslag*, 1938, vol. II, pp. 404, 407 (Batavia, 1938).

Air mails were carried on the following routes during 1937:

Route	Date of opening	Length (miles)	Mail (ton-miles)
Batavia-Bandoeng	November 1928	64	95
Batavia-Semarang-Soerabaja	November 1929	406	5,682
Batavia-Palembang-Singapore	March 1930	629	750
Batavia-Palembang-Pakanbaroe-Medan	November 1930	886	4,439
Soerabaja-Bali	May 1935	203	60
Soerabaja-Bandjermasin-Balikpapan-Tarakan	February 1936	853	2,927
Soerabaja-Makassar	November 1937	492	290

Source: *Indisch Verslag*, 1938, vol. II, p. 404 (Batavia, 1938).

Foreign airborne mails were conveyed between Europe and Batavia by the K.L.M.; since 1937 all mail between the Netherlands and the Netherlands Indies has been carried by air. Mails were taken on from Batavia to Darwin and to Sydney by the K.N.I.L.M. and by Qantas Empire Airways Ltd. Between 1932 and 1937 the development of the air mail service to and from abroad was as follows:

1,000 pieces of air mail

	Despatched	Received	Total
1932	1,210	1,030	2,240
1933	1,314	1,076	2,390
1934	1,345	1,157	2,502
1935	1,516	1,400	2,916
1936	1,701	1,531	3,232
1937	2,852	3,342	6,194

Source: *Indisch Verslag*, 1938, vol. II, p. 407 (Batavia, 1938).

The marked increase in 1937 followed upon the decision to send mails between the Netherlands and the Netherlands Indies exclusively by air.

TELEGRAPHS

The first telegraph line in the Netherlands Indies was put into operation in 1856, for official purposes only, between Batavia and Buitenzorg, the residence of the Governor-General. In the following year, an extension from Buitenzorg was completed to Soerabaja, with a branch line from Semarang to Ambarawa, and the system was opened for public as well as official use. By 1859, there were twenty-eight public telegraph offices and a total length of about 1,700 miles of line. In the early days, the construction and maintenance of lines was an extremely arduous task, due to the long distances involved, the dense jungles and extensive swamps, and other physical difficulties; it frequently happened that sections of line, completed after much arduous labour, were destroyed in a few hours by herds of wild elephants or by forest fires. The lines were laid mainly overhead, with short sections underground, and wherever possible they followed the railways. Submarine cables were laid between the various islands. In addition to the government service, private railway and tramway companies have installed telegraph lines primarily for their own needs, and are licensed to take part in the public telegraph service.

The development of the telegraph system in the present century is shown in the following table:

	Telegraph Offices		Overhead lines (miles)		Underground line (miles)		Submarine cable (miles)	
	Main	Sub-	Length of line	Length of wire	Length of line	Length of wire	Length of line	Length of wire
1900	383	*	*	7,002	*	1,026†	*	*
1910	564	*	*	10,633	*	3,311†	*	*
1920	882	*	*	18,284	*	501	*	6,203
1925	1,015	*	6,709	19,291	72	691	7,539	7,561
1933	1,223	679	5,318	18,603	66	2,210	3,767	3,876
1934	1,223	667	4,983	18,183	66	2,091	1,502	1,675
1935	1,230	643	4,834	18,116	58	2,101	224	271
1936	1,240	644	4,775	17,638	55	2,046	180	203
1937	1,250	640	4,650	17,240	52	2,457	142	162

* Not available.

† These figures include both underground and submarine lines.

Source: (1) *Handbook of the Netherlands East Indies*, 1930, p. 393 (Buitenzorg, 1930); and (2) *Indisch Verslag*, 1938, vol. II, p. 411 (Batavia, 1938).

Submarine Cables

The first submarine cable was laid in 1859 between Batavia and Singapore, where international telegraphic connection was made; this cable was laid via Muntok, where there was a branch to Palembang. It broke several times, however, and as a result of its costly maintenance was abandoned in 1861. In 1871, a second government cable was laid down between Anjer in western Java and Teloekebetoeng in southern Sumatra; it was damaged several times and finally totally destroyed by the eruption of Krakatoa in 1883. A new cable was laid in 1884 between Java and Sumatra, and after that date the total length of government-owned cable increased steadily to a maximum of some 7,500 miles in 1925. After that date, there was a decline in the length of cable in operation, due to the great extension of radio-telegraphic services, and by 1937 the length in operation was only 142 miles. The following table lists the government-owned cables operating in 1939:

From	To	Date opened	No. of conductors	Length (nautical miles)
Ie Meulek (Sabang)	Oeleëlheuë (Sumatra)	1934	1	26.2
Tapaktoean (Sumatra)	Sinabang (Simeuloeë)	1914	1	72.7
Sekong (Java)	Ketapang (Sumatra)	1937	1	16.5
Blimbingsari (Java)	Tjandikesoema (Bali)	1930	1	9.7

Source: *Nomenclature des câbles formant le réseau sous-marin du globe*, p. 25, published by the *Bureau de l'Union internationale des télécommunications* (Berne, 1939).

Several important international cables operated by the British Cable and Wireless Ltd. serve the Netherlands Indies. Those in use in 1939 were as follows:

From	To	Date opened	No. of conductors	Length (nautical miles)
Penang (Malaya)	Medan	1891	1	157·7
Singapore	Batavia No. 1	1881	1	541·7
Singapore	Batavia No. 2	1922-25	1	559·4
Singapore	Banjoewangi	1879	1	939·7
Banjoewangi	Darwin	1871-80	1	1,161·9

Source: *Nomenclature des câbles formant le réseau sous-marin du globe*, p. 46, published by the *Bureau de l'Union internationale des télécommunications* (Berne, 1939).

Radio-Telegraphy

Radio-telegraphy in the early years of this century was regarded merely as a means of communications between steamers and coastal stations, and in 1909 a station was erected for this purpose at Sabang. It was opened in 1911, and has been in constant operation since that date. Since 1924 this station has transmitted a daily weather report to Rangoon during the season of the summer monsoon.

During the period 1912-13, the government radio-telegraphic stations at Sitoebendo, Koepang and Amboina were put into public operation, while the station of the naval department at Weltevreden was used only for public communication with ships. The first three stations functioned both as coastal stations and as fixed stations for the inter-island transmission of telegrams. The obvious advantages of radio-telegraphy, especially for communication with the more remote parts of the Outer Provinces, were increasingly realized, and in 1921 a government radio committee produced a report, recommending the installation of a considerable number of receiving and transmitting stations. By 1937, there were over fifty transmitting stations; the most powerful are at Bandoeng, Medan, Amboina, Koepang, and Manado. In addition, there are some receiving stations only, and a number of civil service 'radio posts', which, although used primarily for government purposes, are also open to the public service. Finally, there are a number of private stations, notably those at Balikpapan, Tarakan and Boela, owned by the *Bataafsche Petroleum Maatschappij*, and at Berouw, owned by the *Koninklijke Paketvaart Maatschappij*; all these are open to the public service.

In 1937, these stations handled some 2·5 million internal telegrams, or nearly three times the number conveyed by the ordinary telegraph system. This total has grown considerably in recent years; thus in 1935 the total was about 1·2 million, or less than half the 1937 figure. In addition, some 7,000 ship telegrams were handled in 1937. The table on p. 461 lists the chief government stations by provinces, together with the date on which each was opened for public service, and the number of messages (excluding ship telegrams) handled in 1937.

International radio-telegraphy. The first regular radio-telegraphic service between a station in the Netherlands Indies and abroad was opened in 1920, between Koepang and Timor-Dilly, the capital of Portuguese Timor. In 1923, after numerous experiments, a powerful station was opened near Bandoeng for public

Radio-Telegraphic Stations, 1937

Station	Residency	Date opened	Messages	
			Despatched	Received
Bandoengradio	Prianger	1923	358,005	336,028
Palembang	Palembang	1933	55,716	56,814
Djambi	Djambi	1934	17,723	18,515
Moearatebo	Djambi	1934	2,252	3,305
Medan	Oostkust v. Sumatra	1924	86,435	81,939
Bengkalis	Oostkust v. Sumatra	1924	3,556	3,060
Bagansiapiapi	Oostkust v. Sumatra	1928	4,316	10,727
Padang	Sumatra's Westkust	1927	26,947	25,479
Singkel	Tapanoeli	1935	958	1,446
Sabang	Atjeh en Ond.	1911	185	142
Sinabang	Atjeh en Ond.	1933	1,187	1,864
Tapatoean	Atjeh en Ond.	1935	1,196	1,698
Rengat	Riouw en Ond.	1930	4,064	6,960
Tandjoengpinang	Riouw en Ond.	1930	16,803	16,957
Tembilahan	Riouw en Ond.	1931	1,654	2,223
Pangkalpinang	Bangka en Billiton	1933	12,135	14,161
Tandjoengpandan	Bangka en Billiton	1934	4,708	5,053
Pontianak	W. Afd. v. Borneo	1927	28,902	36,906
Bandjermasin	Z. O. Afd. Borneo	1929	38,411	39,408
Kotabaroe	Z. O. Afd. Borneo	1932	3,569	4,857
Samarinda	Z. O. Afd. Borneo	1933	14,352	14,880
Tanahgrogot	Z. O. Afd. Borneo	1932	1,625	2,267
Tandjoengseilor	Z. O. Afd. Borneo	1932	2,293	2,885
Tarakan	Z. O. Afd. Borneo	1935	6,957	6,631
Balikpapan	Z. O. Afd. Borneo	1935	56,471	53,378
Sangkoelirang	Z. O. Afd. Borneo	1935	1,056	1,123
Manado	Manado	1924	82,703	80,911
Tahoena	Manado	1928	2,277	2,413
Gorontalo	Manado	1931	13,098	13,464
Donggala	Manado	1934	5,051	5,450
Makassar	Celebes en Ond.	1927	163,295	155,514
Baoebaœ	Celebes en Ond.	1925	1,981	3,284
Amboina	Molukken	1913	65,288	57,850
Neira	Molukken	1921	2,771	3,197
Dobo	Molukken	1922	6,330	6,232
Merauke	Molukken	1925	2,014	2,034
Saumlaki	Molukken	1931	1,254	1,272
Toeal	Molukken	1931	3,329	3,317
Fakfak	Molukken	1932	1,973	2,081
Laboeha	Molukken	1932	1,485	1,838
Manokwari	Molukken	1921	4,325	3,449
Seroei	Molukken	1932	1,285	1,108
Ternate	Molukken	1933	8,511	8,629
Tobelo	Molukken	1932	1,352	1,974
Babo	Molukken	1935	3,441	2,348
Hollandia	Molukken	1937	663	835
Koepang	Timor en Ond.	1912	8,792	9,455
Waingapoe	Timor en Ond.	1922	2,207	2,332
Ende	Timor en Ond.	1923	2,877	3,791
Bima	Timor en Ond.	1922	4,325	5,632
Ampenan	Bali en Lombok	1936	1,141	1,429
Total			1,146,957	1,134,129

Source: *Indisch Verslag*, 1938, vol. II, p. 412 (Batavia, 1938).

service with the Netherlands. These two stations handle all the external radio-telegrams received and transmitted in the Netherlands Indies; as the following table shows, Bandoeng is by far the most important:

Station	Transmitted		Received		Total
	To the Netherlands	To other countries	From the Netherlands	From other countries	
Bandoeng-radio Koepang	76,683 —	107,919 1,165	67,194 —	92,815 515	344,611 1,680
Total	76,683	109,084	67,194	93,330	346,291

Source: *Indisch Verslag*, 1938, vol. II, p. 412 (Batavia, 1938).

NOTE—These figures include telegrams in transit.

Foreign radio-telegraphic messages in 1937 totalled about half those handled by cable. Between the Netherlands Indies and the home country, however, there were about 144,000 radio-telegrams, almost the same number as those handled by cable.

TELEPHONES

The first telephone system in the Netherlands Indies was operated in 1883, when three private companies installed exchanges, each with a small number of lines, at Batavia, Soerabaja and Semarang. Gradually the number of companies increased, and, as a result, by 1898 there were thirty-five separate networks. The first inter-urban connection, between Batavia and Soerabaja, also operated by private enterprise, was installed in 1894. Clearly, the multiplicity of small privately-owned networks had many disadvantages, and in 1906 they were taken over by the government. Since that time, local and long-distance telephonic communication has increased enormously, and many of the most distant estates are connected to the system. There was, however, a decline in numbers of subscribers during the depression years, and in 1937 the total was still well below the peak year of 1930. The following table shows the growth in the number of exchanges and subscribers:

Year	No. of exchanges	No. of direct subscribers	No. of extensions	Total
1910	55	6,500		6,500
1920	251	24,438	7,763	32,201
1925	308	27,367	10,194	37,561
1930	352	34,565	14,882	49,447
1933	350	26,893	11,374	38,267
1934	342	26,269	11,138	37,407
1935	338	26,010	10,849	36,859
1936	338	26,367	10,895	37,262
1937	338	28,718	12,641	41,359

Source: (1) *Indisch Verslag*, vol. II, 1938, p. 413 (Batavia, 1938); and (2) *Handbook of the Netherlands East Indies*, 1930, p. 395 (Buitenzorg, 1931).

Of the 41,000 telephones installed in 1937, more than 36,000 were in Java and Madoera.

The length of line in 1937 is shown in the following table:

	Local (miles)	Inter- urban (miles)
Overhead wires	13,294	2,732
Underground cables	761	72
Total	14,055	2,804

Source: *Indisch Verslag*, 1938, vol. II, p. 413 (Batavia, 1938).

These figures refer of course to the length of line, not of wires, which totalled more than 200,000 miles of local and 30,000 miles of inter-urban circuits.

Radio-Telephony

With the development of short-wave radio, the prospect arose of direct telephonic communication between the Netherlands Indies and the mother country. This was achieved in 1927, when a speech broadcast from the transmitter at Malabar was heard in the Netherlands, and in 1929 the station was opened for regular public service. Much government business was transacted in this manner between Java and the Netherlands, and increasing use was made for commercial purposes. This direct radio-telephonic link has been extended to Siam, Indo-China, Malaya, Japan, the Philippines, the United States and Australia. Considerable use too has been made of the various inter-island connections. The following table shows the growth of the service since 1932:

Number of Connections

	Government calls	Within the N.E.I.	Transmitted to other countries	Received from other countries
1932	Not available	331	2,314	1,336
1933	601	371	2,084	1,310
1934	1,017	516	2,040	1,429
1935	1,477	624	2,129	1,627
1936	1,226	1,077	3,031	2,080
1937	1,719	4,469	6,041	3,467

Source: *Indisch Verslag*, 1938, vol. II, p. 414 (Batavia, 1938).

Of the 9,508 calls between the Netherlands Indies and other countries, 8,324 were with the mother country.

BROADCASTING

Programmes are broadcast by the *Nederlandsch-Indië Omroepzender Mij.* (Netherlands Indies Broadcasting Company). These are transmitted by twenty-four stations, some of which are also engaged on radio-telegraphic work; all these stations, except that at Medan, which acted as a relay, are situated in Java. In 1937, there were some 54,000 licenced receiving sets, of which nearly 33,000 were owned by Europeans, 12,000 by natives and 9,000 by Foreign Asiatics.

NOTE ON TIME

Owing to the considerable longitudinal extension of the Netherlands Indies—between about 95° E and 140° E—the archipelago falls into several time zones. These may be summarized as follows:

- (i) *North Sumatra*—the meridian of $97^{\circ} 30'$ E, or 6 hr. 30 min. in front of G.M.T.
- (ii) *South Sumatra*—the meridian of $105^{\circ} 00'$ E, or 7 hr. 0 min. in front of G.M.T.
- (iii) *Java, Madoera, Bali, Lombok and Borneo*—the meridian of $112^{\circ} 30'$ E, or 7 hr. 30 min. in front of G.M.T. The Lesser Soenda islands, including Soembawa, Soemba, Flores and Timor, also fall into this zone.
- (iv) *Celebes*—the meridian of $120^{\circ} 00'$ E, or 8 hr. 0 min. in front of G.M.T.
- (v) *Wetar, Soela islands and the Moluccas*—the meridian of $127^{\circ} 30'$ E, or 8 hr. 30 min. in front of G.M.T.
- (vi) *New Guinea*—the meridian of $135^{\circ} 00'$ E, or 9 hr. 0 min. in front of G.M.T.

Appendix IV

CIVIL AVIATION

In the years before the outbreak of the present war the Netherlands Indies had become the focus of air routes from Europe, India, the Far East and Australia. Dutch, British, and Australian air lines, and those of many other nations, used the air facilities available in the various islands of the archipelago. The chief commercial aerodromes are Batavia, Bandoeng, Semarang and Soerabaja in Java, and Palembang, Medan and Padang in Sumatra. There are in addition many smaller aerodromes and a large number of landing grounds for aircraft.

Civil aviation within and across the Netherlands Indies is maintained primarily by the *Koninklijke Nederlandsche-Indische Luchtvaart Mij.* (Royal Netherlands Indies Airways), better known by its initials K.N.I.L.M. Other companies operating in the archipelago are the *Koninklijke Luchtvaart Mij.* (K.L.M.) and the Qantas Empire Airways Ltd. The seat of the K.N.I.L.M. is in Amsterdam and management is vested in a board of directors, which has a representative with full powers at Batavia. The company was founded in 1928 and in the same year an agreement was made with the Netherlands Indies government in which it was laid down that the K.N.I.L.M. should receive an annual subsidy to cover any possible loss. This agreement also stipulated that if a profit accrued the government were to receive three-quarters of the amount. The K.N.I.L.M. opened its activities in 1928 with a daily service between Batavia and Bandoeng and a similar service between Batavia and Semarang. In the succeeding decade the services were greatly extended and improved. When starting its activities K.N.I.L.M. aircraft flew about 17,500 miles a month; in 1938 they covered a distance of nearly 150,000 miles a month.

Route	Frequency
Batavia-Bandoeng	Two or three times daily according to season.
Batavia-Semarang-Soerabaja	Once, twice or three times daily
Batavia-Palembang-Singapore-Saigon	Weekly
Batavia-Palembang-Pakanbaroe-Medan	Weekly
Soerabaja-Bandjermasin-Balikpapan	Twice-weekly with extension to Tarakan once a week
Soerabaja-Denpasar (Bali)	Three times weekly
Soerabaja-Makassar	Weekly
Batavia-Sydney	Twice-weekly

The connections with Sydney and with Saigon outside the archipelago were instituted in 1938. In accordance with restrictions imposed practically everywhere in the world on international air traffic, the Australian government, in granting permission for the opening of an air service from Batavia to Sydney, laid down that no mail was to be carried from Australia and local transportation of passengers and goods within Australia was also prohibited unless such transportation had been specially requested by or on behalf of the Australian government. The K.N.I.L.M. service to Australia is linked up with the *Koninklijke Luchtvaart Mij.* (K.L.M.) service from Amsterdam to Batavia, making it possible to travel in eight days from

Amsterdam to Sydney. Similarly, the connection with Saigon forms an important link in the air traffic between Australia and the Far East. Restrictive regulations, similar to those stipulated by the Australian government, safeguard the interests of Air France in Indo-China.

The traffic on the regular lines of the K.N.I.L.M. in 1938 is shown in the following table:

Traffic carried by K.N.I.L.M., 1938

	Miles flown	Passengers	Mail carried	Freight carried
Batavia-Bandoeng	99,778	11,485	4,428	39.3
Batavia-Soerabaja	336,003	3,635	46,345	13.5
Batavia-Saigon	55,425	929	5,601	8.8
Batavia-Medan	80,693	1,377	14,499	17.2
Soerabaja-Tarakan	144,060	1,893	21,393	13.9
Soerabaja-Denpasar	38,690	667	901	1.7
Soerabaja-Makassar	50,405	298	8,088	1.7
Batavia-Sydney	418,879	698	17,936	5.4
Total, 1938 (regular lines)	2,003,115	20,972	54,067	101.5

Based on official sources.

This table shows that over one-half of the passengers carried by K.N.I.L.M. travelled on the Batavia-Bandoeng service. Passenger traffic to places outside Java was relatively small.

A number of additional services were under consideration by K.N.I.L.M. in 1938. These included an extension of the weekly Batavia-Tarakan service to Manila, an extension of the weekly Soerabaja-Makassar service to Dutch New Guinea, via Amboina, a service from Batavia to Padang, via Benkoelen, another from Batavia to Singapore via Billiton and Pontianak and an extension of the Batavia-Medan service to Sabang.

In addition to maintaining an airline the K.N.I.L.M. has carried out much aerial photography and cartography. An enormous area in the Vogelkop peninsula of western New Guinea has been photographed from the air by aircraft belonging to this company. Similar work is being done or is under contract in parts of Celebes and Borneo.

The K.N.I.L.M. looks after the interests of the Royal Dutch Airlines (*Koninklijke Luchtvaart Mij.*) or K.L.M. in the Netherlands Indies and acts as the agent for many foreign airlines, including Imperial Airways, the Qantas Empire Airways and Air France. The K.L.M. maintains three services a week in both directions between Amsterdam and Batavia, with intermediate stops in the archipelago at Medan and Palembang. All technical arrangements at the eastern end of the Netherlands-Java route are carried out by the K.N.I.L.M.

In 1938, at the time when the K.N.I.L.M. was rapidly extending its services, there came into operation the British airmail scheme for a three-weekly service with large flying boats between England and Australia. Imperial Airways operate the route from England to Singapore and the Australian company, Qantas Empire Airways, the route from Singapore to Sydney. The places of call in the Netherlands Indies are Batavia (Tandjoengpriok), Soerabaja, Bima and Koepang; Klabat bay in the north of the island of Bangka is an optional place of call. For this flying-boat service the government of the Netherlands Indies stipulated the same conditions as apply to the K.N.I.L.M. service in Australia.

Appendix V

POLITICAL AND ECONOMIC CONDITIONS IN THE NETHERLANDS INDIES FROM 1939 TO 1944

CONDITIONS BETWEEN SEPTEMBER 1939 AND DECEMBER 1941

The Netherlands Indies were not directly involved in the European war of 1939 until, in December 1941, Great Britain and the United States were attacked by Japan, and the Netherlands and consequently the Netherlands Indies declared war on Japan. Nevertheless considerable indirect effects had been experienced.

With the occupation of the Netherlands by Germany in 1940, exports from the Netherlands Indies were diverted largely to Great Britain and to a lesser extent to the United States, and imports of manufactured goods, much reduced in amount, were derived from the same two countries. The Netherlands Indies government continued and increased its efforts to encourage the establishment of industries in the islands. The Netherlands government in London continued to bear the same relation to the Netherlands Indies government as it did before the occupation of the Netherlands (see p. 106), though the Governor-General and his subordinates were given even greater freedom of action.

Relations with Japan, 1940-41

In February 1940, the Japanese notified the Dutch government that they could no longer abide by the existing arbitration treaty, and almost at the same time asked it to enter into formal negotiations regarding a number of economic problems. As the result of its denunciation by the Japanese, the arbitration treaty lapsed in August of that year. The Netherlands had already been invaded by Germany in May, when the Dutch government was still framing its reply to the Japanese request for negotiations. Meanwhile the Japanese Foreign Minister had made a public statement that Japan was economically bound up with the Netherlands Indies 'by an intimate relationship of mutuality in ministering to each other's needs', and implying that in the event of the Netherlands becoming involved in the war Japan would take measures to protect her interests. A reply came immediately from the United States, where the Secretary of State, Mr. Cordell Hull, reminded Japan that in the Notes accompanying the Treaty of Washington in 1922 both governments had intimated their resolve 'to respect the rights of the Netherlands in relation to their insular possessions in the region of the Pacific Ocean'. The Dutch government also replied that, should the Netherlands be involved in the war, no protection for the Indies would be accepted or requested from any power. On 14 May 1940, after the invasion of Holland, when Japan renewed its request for negotiations, the Netherlands Indies replied in general terms deprecating a general discussion but expressing a willingness to consider concrete proposals. Japan, however, was assuming a more threatening attitude. An official statement in June, including the Netherlands Indies in the Japanese sphere of interest, was backed up a few days later by another speech to the same effect from the Japanese Foreign Minister, and, when the Japanese government in July announced its intention to send a mission,

the government of the Netherlands Indies reluctantly acquiesced. Before the mission departed, however, the prospects of a satisfactory issue were made still more doubtful by the advent to power of a new government of a more aggressive colour under Prince Konoe. He had always advocated a forward policy in southern waters, and for some time had been president of one of the South Seas Associations. As soon as he assumed power sixteen of these associations joined to form the Japan Federation of South Seas Associations, which aimed at promoting closer co-operation with the government in a southward policy. Naturally his keen interest in this aspect of Japanese expansion was re-echoed in a chorus of political speeches and in the press.

It was, therefore, with lively anticipations of a diplomatic victory that the mission left Japan. When it reached Batavia in September 1940, it had no settled programme for discussion and was chiefly concerned to obtain large supplies of local produce, especially oil. In place of the normal annual supply of 600,000 metric tons, the Japanese wanted 3,750,000 tons, including 1,100,000 of aviation crude oil and 400,000 tons of high octane aviation gasoline. The government declined to negotiate on this subject as it was primarily a matter for the oil companies. After considerable discussion these companies finally entered into a joint contract to supply oil for six months at the rate of 1,936,000 tons a year, including 120,000 tons of aviation crude oil and 33 tons of high octane gasoline. In November the Japanese put forward proposals for the supply of other products, but as they still formulated no comprehensive programme for dealing with specific points of difference between the two countries, the government suggested that it was time for the delegation to return.

In Japan, however, so much had been expected of the mission that the government would have lost face if it had returned after accomplishing so little. At length, therefore, on 16 January 1941 a memorandum was submitted for discussion. Just then the Foreign Minister, in announcing to the Japanese diet the resumption of negotiations, referred to the Netherlands East Indies, Indo-China and Siam as included in the New Order for Greater Eastern Asia under the leadership of Japan. The Netherlands Minister in Tokyo lodged an immediate protest against this view of the future of the Netherlands Indies, and in Batavia the leader of the local delegation replied promptly to the new memorandum, repudiating the conceptions on which it was based. The grounds alleged by the Japanese for their proposals were that Japan and the Indies were 'economically inter-dependent' because Japan was nearer than Europe or America; that the Japanese were therefore entitled to special facilities in the Netherlands Indies generally; and particularly in those areas that as yet were inadequately developed. On these grounds the Japanese asked for a relaxation of the restrictions on Japanese entry, for general permission to fish and prospect, and for unrestricted admission to all the coastal ports that had been closed to foreigners. The request for unimpeded rights of fishing and prospecting covered just those activities which in the Netherlands Indies had come to be regarded with suspicion on political grounds. Similarly the request for free entry into coastal ports ignored the fact that these ports had been closed in order to prevent the access of the Japanese to places where they could not be supervised. Quite apart, therefore, from the assumptions on which the memorandum was based, the actual proposals were wholly unacceptable.

The extravagance of the Japanese demands encouraged the local authorities to frame a stiff and prompt reply. Firstly, it affirmed that the welfare, progress and emancipation of the people was a prime object of policy, and that measures tending to the contrary could not be accepted; that foreign relations had always rested on the basis of strict non-discrimination without allowing a preponderance to any one power in any field of economic activity; and that, during the war, a paramount consideration was to prevent advantage to the enemy and to safeguard home defence. Secondly, the backwardness of certain areas was ascribed to the poverty

of their natural resources; the reply went on to reject the claim of Japan to any special interest on the ground of proximity; it pointed out that exports to the Japanese empire had been declining, and that there had been little rise even after the European market had been cut off by the war. The Dutch accompanied this answer with counter proposals: that Japan should take more local products, especially sugar and coffee; that yen balances accruing to Dutch nationals in Japan should be freely available for all lawful purposes; and that Dutch business in Japan should not be impeded by restrictions.

This firm answer cooled Japanese ardour, and they displayed a more moderate spirit when negotiations were resumed. The Japanese now asked for numerous oil concessions and for supplies of produce useful as war material. The local government responded by granting provisionally one oil concession as a reasonable extension of the Japan-Borneo Oil Company, and approved the supply of certain quantities of produce as shown in the table below. The quantities allowed

Supplies to Japan
(thousands of tons)

Commodity	Previous Quota	Japanese demand	Supply approved
Petroleum	600	3,750	1,936
Tin	3	12.5	3
Manganese	—	27	10
Nickel	—	180	150
Bauxite	360	400	250
Rubber	20	30	15
Copra	12	70	20
Palm oil	1	30	12

Based on official sources.

were criticized by the British government as being in general excessive, especially in view of the fact that recent developments had enabled Japan to obtain a larger proportion of its requirements from Indo-China and Siam. Arrangements were made accordingly for a reduction under certain heads in future years. In June 1941, a memorandum of the terms was handed to the Japanese delegates with a view to ending the negotiations.

The next step was the introduction by Japan in July 1941, of a new system of export licences which had the effect of practically stopping exports to the Netherlands Indies, though Dutch firms were still allowed, on paying cash, to buy goods on the off chance of obtaining an export licence. Then, in view of further aggression by the Japanese in Indo-China, the Dutch government extended the system of export licences, already in force for Japan, to the whole Japanese empire and to territories, such as China and Indo-China, under Japanese occupation; it suspended the exchanges between the Netherlands Indies and Japan, and forbade banks in the Netherlands Indies to pay out money to Japanese subjects or to place money to their credit without a special permit. Thus all commercial and financial relations with Japan were subjected to the obtaining of a special permit, though Japanese firms were allowed to carry on their business. The delegation charged with conducting conversations was dissolved, and Japanese statements that the Netherlands Indies were inclined to restore normal trade relations were repudiated officially as 'absolutely untrue'.

CONDITIONS DURING THE JAPANESE OCCUPATION, 1942-44

The invasion of the Netherlands Indies by the Japanese began in the early part of January 1942, and the occupation was complete before the middle of the year, though the greater part of Dutch New Guinea and the more remote parts of other islands were probably never occupied.

Political Conditions

The administrative organization of the archipelago was reorganized by the Japanese. Sumatra and some of the neighbouring islands were included with Malaya under a military administration with Singapore as the centre; Java, Madoera and possibly some other islands constituted a second area, also under military administration, with Batavia as the capital. Two other areas were set up under naval administration, one including the whole of Borneo, both British and Dutch, and the other Celebes, the Lesser Soenda islands, the Moluccas and New Guinea. A considerable number of Japanese civilians were given administrative posts, but seem always to have been subordinate to the military and naval authorities; the latter were said to be working in close collaboration with the Ministry for Great East Asia, but appear in fact to have been nearly autonomous. The inevitable result was a lack of co-ordination between the different areas. The Japanese adopted the Dutch administrative arrangements within the four large areas, with only minor modification, though Dutch officials were removed and replaced by Indonesians or Eurasians.

Dutch and other Europeans were also ousted from non-official positions, the object being to effect a permanent eradication of Dutch influence. The Japanese attached much importance to their efforts to win the active support of the Indonesians, and claimed to be their champions and deliverers from Dutch imperialism in spite of their obvious economic exploitation of the Netherlands Indies.

Reverence for Japanese authority was strongly inculcated and the learning of the Japanese language encouraged in every way. In spite of all this, none of the old political parties became pro-Japanese, so they were all dissolved in 1942 and a single Indonesian party, the *Poetera*, was formed. This was led by Soekarno who was joined by a few disloyal politicians, and was intended as a rallying point of pro-Japanese Indonesian sentiment. Neither the *Poetera*, nor an attempt to enlist the sympathies of the large Muslim element in the population, met with any appreciable success.

Economic Conditions

As a result of the occupation of British and Dutch territory Japan gained control over far larger supplies of many commodities than she could consume. At the same time, these occupied territories found themselves cut off from trade with the outer world and deprived both of much-needed markets and of consumer goods, which Japan was in no position to supply in adequate quantities. Thus, the occupation was an economic disaster for the Netherlands Indies and a limited though appreciable benefit for Japan. The loss to the Indies was increased, and the benefits to Japan further restricted, by the lack of shipping, which prevented the development of the optimum trade between the various territories in the Japanese 'Co-Prosperity Sphere' in south-east Asia.

The economic policy adopted by Japan in these circumstances was to draw what raw materials she wanted from the Netherlands Indies without giving much in return. An attempt was also made to promote self-sufficiency within the Indies by reducing the area devoted to export crops and increasing that devoted to food crops; at the same time the development of industry was proceeded with, though no

radical innovations were undertaken. Under Dutch rule the islands had been nearly self-supporting in rice, though some districts depended on imports from areas with an exportable surplus. These districts were exposed to the danger of famine, owing to the shortage of shipping after the occupation. It was particularly in parts of Sumatra and Borneo that steps had to be taken to increase the growing of rice in order to avert this danger.

Japan was particularly interested in exploiting the mineral resources of the Netherlands Indies and in encouraging the production of quinine, cotton, jute and other fibres. Oil was the most important of the mineral products from the Japanese point of view, though the mining of tin and bauxite was also continued. Other minerals, exploited on a small scale, if at all, before the occupation, which are probably worked to a greater extent by the Japanese, are manganese, nickel, diamonds and platinum.

The Netherlands Indies were brought into the yen bloc, and the exchange rate of the guilder, the Straits dollar and the yen was fixed at par. In Sumatra, the guilder was replaced by the yen soon after the occupation; in Java, the guilder remained legal tender, but the military authorities issued notes of their own in guilder denominations. In October 1942, the liquidation of the Java Bank was announced, though its notes remained legal tender. Japanese banks, among them the Yokohama Specie Bank, the Bank of Formosa and the South Seas Development Bank, were not slow in getting a grip on the economic life of the Indies. The Japanese also stopped payment of interest on the Netherlands Indies government loans, and thus dealt a heavy blow at the General People's Credit Bank (see p. 219), in which the funds of the native villages were deposited. The Japanese, however, in order to maintain their pose as friends of the natives, announced that they would reorganize this bank and pay $2\frac{1}{2}\%$ interest on the deposits.

European owners of plantations and factories were expropriated and control was vested in Japanese boards. By the end of 1942, fifty Japanese firms were said to be established in Java, and the Japanese authorities had strictly controlled all trade. Prices were stabilized and, except for scarce consumer goods, had risen little since before the occupation.

Appendix VI

SARAWAK

GENERAL DESCRIPTION

Sarawak is a sovereign state under British protection and ruled by a hereditary rajah of British birth; it lies in the north-west of Borneo. There is a coastline of about 500 miles, from Tandjoeng Datoek in the south to Brunei bay in the north. Sarawak extends inland as far as the main watershed which runs in an approximately SSW-NNE direction through the middle of the island. On the south and east Sarawak is bounded by Dutch Borneo, on the north it has a short common frontier with British North Borneo. The state of Brunei forms two separate enclaves in the north of Sarawak. The total area of the country is about 50,000 sq. miles; it is thus about as large as England and Wales.

Most of the country is hilly or mountainous and there are no extensive plains. The boundary with Dutch Borneo follows for most of its course discontinuous ranges of mountains of varying height. From these ranges spurs and broken chains of peaks run out, mainly in a westward direction, towards the South China Sea. The highest peaks are Penrissen (4,450 ft.) and Poi (6,460 ft.) on the southern frontier, Batu Tibang (6,200 ft.) and Murud (7,200 ft.) on the watershed between Sarawak and eastern Dutch Borneo, and Dulit (4,800 ft.), Batu Lawi (6,300 ft.), Mulu (7,950 ft.) and Kalulong (5,500 ft.) in the north of the state. Near the sources of the Batang Lupar the dividing mountain ranges are broken by a gap which forms a comparatively easy overland route from Sarawak to the Kapoeas basin in Dutch Borneo. Geologically, Sarawak is very similar to the rest of Borneo; many of the mountains are built of sandstones of Tertiary age.

Numerous large rivers flow from the mountain ranges towards the South China sea, mostly following a more or less westerly or north-westerly direction. The chief rivers from south to north are the Sarawak, on which stands Kuching, the capital, the Batang Lupar, the great Rajang with its tributaries, the Baloï and the Bellaga, the Baram with its tributary the Tinjar, the Limbang and the Trusan.

Most of the country is still forest-covered, thinly scattered with small native villages and cultivated clearings, but in the south in the neighbourhood of the Sarawak river a considerable area has been cleared and cultivated. The only town of any size is Kuching (population, 25,000), situated on the Sarawak river about twenty miles from the sea (Plate 126). It is well laid out with broad, clean streets and many fine public buildings, including an excellent museum of anthropology and natural history; its trees and gardens and the background of the forest-covered Mattang mountain make it one of the most charming towns in the East. Other towns are Simanggang on the Batang Lupar, Sibu on the Rajang, Oya, Mukah and Bintulu on the coast between the mouth of the Rejang and that of the Baram, Miri on the coast just south of the Baram mouth, a place of recent growth and the centre of an important oilfield, Baram, Marudi or Claudetown on the Baram river and Limbang and Lawas in the extreme north. The native villages are mainly situated on river banks at a low altitude, the chief exceptions being those of the Kalabit tribe which are on an inaccessible plateau in the north of the country at an average height of about 3,000 ft.



Fig. 120. Sarawak

Source: 1 : 1,000,000 series (G.S.G.S. 4204)

The climate, like that of the rest of Borneo, is hot and moist, but not particularly unhealthy. The temperature seldom rises above 90° F. or falls below 70° F. The rainfall is heavy and well distributed through the year. At Kuching the average annual rainfall is 160 in., of which 97 in. falls in the wet monsoon from November to the end of March. In some other places the annual total is rather lower (e.g. Sibü, 113 in.) and in a few a little higher.

The natural vegetation of Sarawak is everywhere forest, luxuriant tropical rain forest or swamp-forest in the lowlands, montane rain forest on the mountains; there are no natural savannas. The flora is typically Indo-Malayan. Characteristic Malayan plants such as the trees of the family *Dipterocarpaceae* and the pitcher plants, *Nepenthes*, are everywhere common. The soil is not particularly fertile, but in some parts commercial crops, especially rubber, are grown. For the most part, however, agriculture consists of primitive *ladang* cultivation of hill rice, as practised by the natives elsewhere in Borneo.

Animal life is rich and varied and there is an abundance of mammals, snakes and brightly coloured birds and insects. As everywhere in Borneo, land leeches abound in the jungle and are a constant nuisance to the traveller. The fauna includes characteristic Bornean species, such as the proboscis monkey and in certain limited districts the orang-utan. Among the more striking birds are the hornbills and the argus and Bulwer's pheasants. As far north as the Bintulu river and Gunong Dulit the birds and mammals are essentially the same as in western Dutch Borneo; north of this line the fauna is more like that of British North Borneo.

HISTORY

The early history of Sarawak is bound up with that of the once powerful Malay kingdom of Brunei (see p. 480). Until Rajah Brooke was installed in 1840 the whole of the present territory of Sarawak formed part of the domains of the sultan of Brunei, though the authority of the sultan had long since fallen into decay and over most of the country was nominal rather than real. Like the rest of northern Borneo, Sarawak shows traces of Chinese influence at a period before the coming of the Malay rulers. Place-names and antique Chinese jars and beads, still cherished by the natives, testify to this ancient Chinese influence. The Hindu empire of Majapahit in Java, which was conquered by the Muslims in 1478, also extended at one time to Sarawak; traces of Hindu influence are still evident, especially among the Land Dyak.

The modern history of Sarawak begins in 1839 when James Brooke paid his first visit to the country. James Brooke was born in India in 1803 and was the son of an Indian civil servant. As a young man he entered the army of the English East India Company and, after being wounded, resigned his commission and determined to travel in the Eastern seas, the lure of which had captured his imagination. When his father died in 1835 he was left with sufficient money to buy the yacht *Royalist* in which he sailed to Singapore. Here he was commissioned by the Governor to take a letter of thanks to the Rajah Muda Hasim of Sarawak, heir-apparent to the throne of Brunei, who had recently shown kindness to some shipwrecked English sailors. The *Royalist* arrived at Kuching on 15 August 1839, and Brooke was well received by the Rajah who pressed him to return after continuing his travels.

At that time the former glories of the Brunei sultanate had long passed away. Lawlessness and misgovernment had reduced the people of Sarawak to a pitiable condition. The coastal districts were infested with pirates and, as Brooke himself wrote afterwards, the life of the natives was one of 'watchfulness, hide and seek, and fight or flight . . . in the course of each year many lose their lives or their liberty'. Shortly before Brooke's arrival the Sarawak Malays and the Land Dyak had been provoked to rebellion by the exactions of the *pangiran* or governor imposed on them by the sultan of Brunei. The amiable but weak Rajah Muda Hasim had been sent to Sarawak by his nephew, the sultan, in order to quell this rebellion.



Plate 126. Kuching, Sarawak

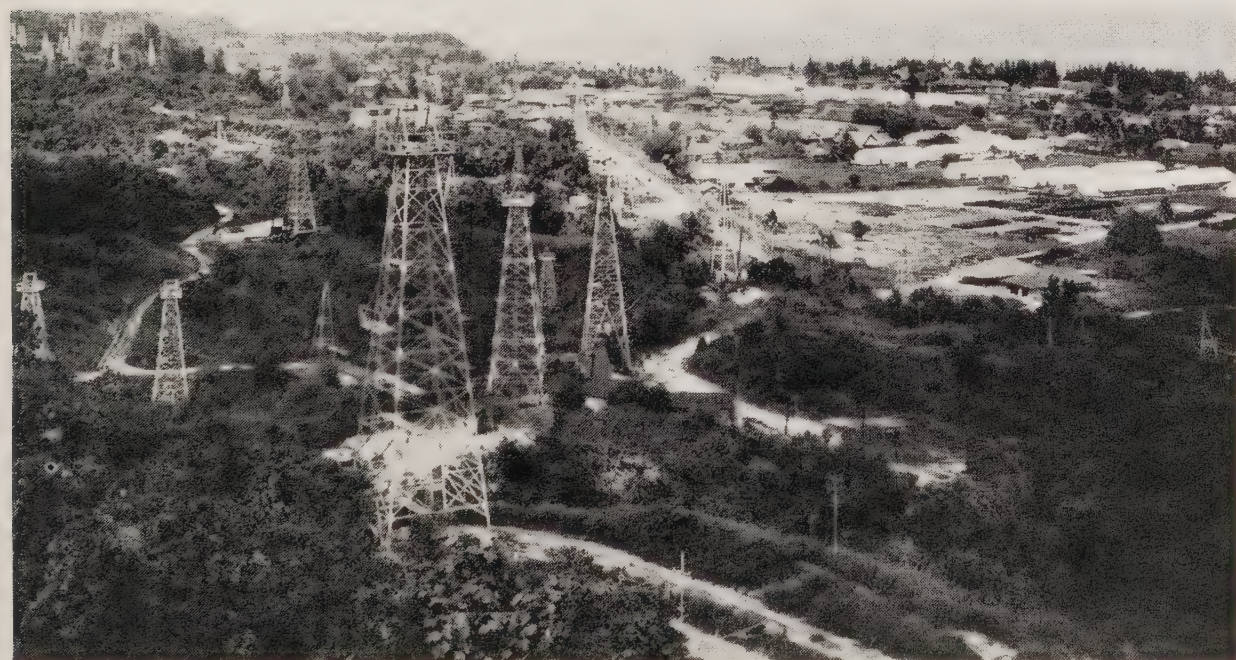


Plate 127. Miri oilfield, Sarawak



Plate 128. Jesselton, British North Borneo

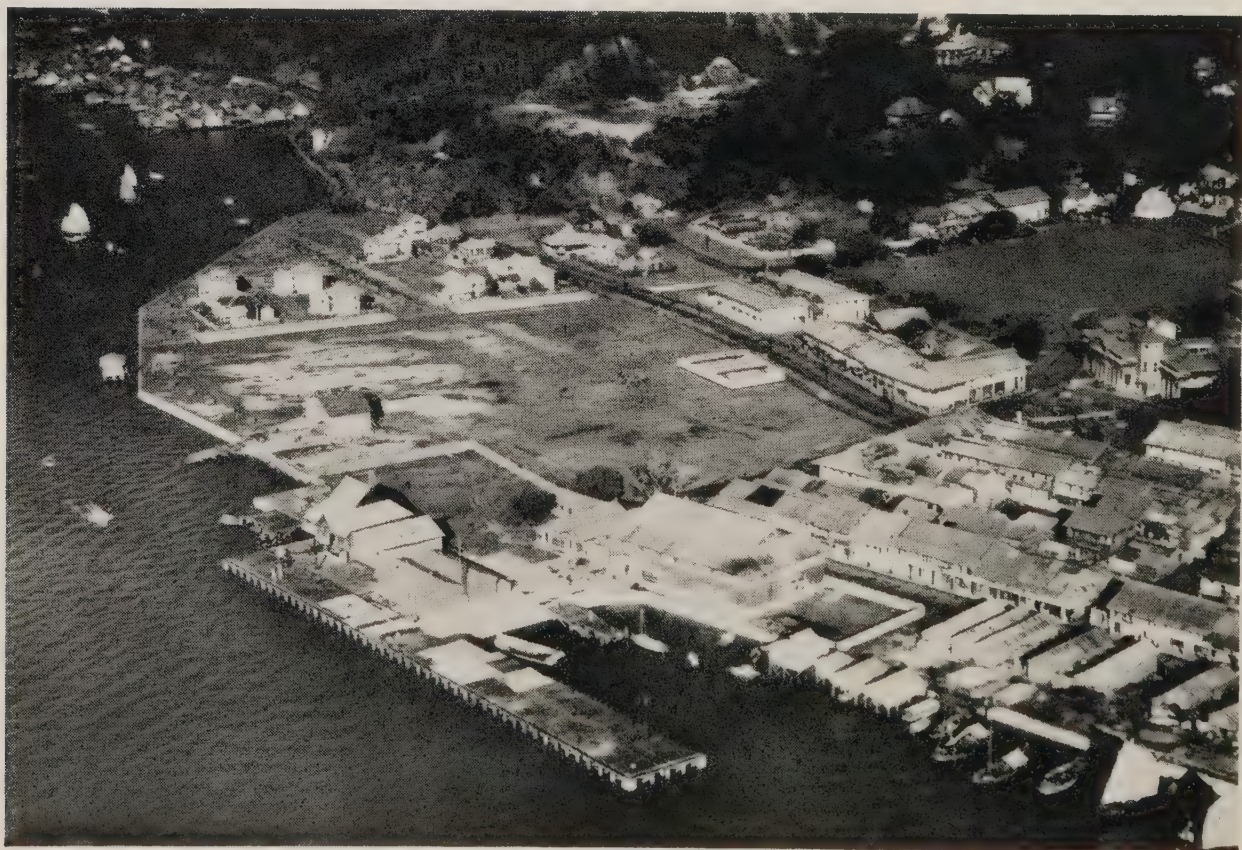


Plate 129. Sandakan, British North Borneo

In this task Hasim had no success. He feared disgrace if he returned to Brunei with his mission unfulfilled and, when Brooke visited him a second time in 1840, he begged his help in restoring order. Eventually, Rajah Muda offered to Brooke 'the country of Siniawan and Sarawak, with its government and trade', together with the title of rajah. Brooke accepted the offer with some reluctance, but set to work at once to check piracy and oppression. He rapidly gained the enthusiastic goodwill of Malays and Dyak alike and on 24 September 1840, after much intrigue on the part of Rajah Hasim, he was declared Rajah and Governor of Sarawak amidst the roar of cannon and general rejoicing. Brooke's title, a feudal one subject to the overlordship of the sultan, was confirmed at Brunei in August 1842.

The chief objects of the new government were to rescue the peaceable Land Dyak from oppression, to suppress piracy and to abolish head-hunting. The first of these tasks was comparatively easy, but the second demanded greater forces than the rajah had at his disposal. After several efforts he succeeded in interesting the British government in the matter and in May 1843, H.M.S. *Dido* under the command of Captain (afterwards Admiral Sir Henry) Keppel was sent to Borneo. The rajah's nephew, Charles Johnson, who afterwards succeeded him as second rajah, was a midshipman on the *Dido*. This was the beginning of a long campaign against piracy, but it was ultimately successful and by 1880 piracy was entirely stamped out.

On his return to England in 1847, Brooke was received by the Queen and fêted everywhere, but it was not long before the new government made its enemies. In 1850 a misinformed agitation was started in parliament and in certain newspapers; Cobden and other radicals supported it. Brooke was represented as a cruel butcher and the pirates as harmless and peace-loving natives. Brooke, however, found powerful defenders, including Lord Palmerston, and before long the excellence of his government and the loftiness of his personal character were generally recognized. In 1863 the British government recognized Sarawak as an independent state and the rajah was made a K.C.B. In 1888 a treaty was signed giving Sarawak British protection. The British government undertook to look after all foreign relations, leaving internal affairs entirely in the hands of the Sarawak government.

After overcoming its initial difficulties the Sarawak government continued to follow the path on which it had begun. All its original aims have been accomplished, though the third of them, the abolition of head-hunting, was not completely realized until the present century. All this has been done with very little loss of life and the use of remarkably little force. Until the invasion of the country by the Japanese in December 1941, the only interruption to a history of steady progress was the Chinese rebellion of 1857, in which the rajah nearly lost his life. Economically, Sarawak has had a record of continually increasing prosperity. As the first aim of the government has always been native welfare, Sarawak has not given as warm a welcome to capital investment as neighbouring territories, and industries, such as rubber planting, have not developed on a large scale. An exception is the growth during the last thirty years of the Miri oilfield which has brought the country much wealth (Plate 127).

The first rajah died in 1868 and was succeeded by his nephew, Sir Charles Johnson Brooke (he had previously assumed the name of Brooke). In 1917 the present rajah, Sir Charles Vyner Brooke, succeeded his father.

The state of Sarawak, as originally acquired by Sir James Brooke, was a diminutive territory; it extended from Tg. Datoek to the mouth of the Sadong and included the Sarawak, Lundu and Samarahan river basins. Successive additions to its territory at the expense of Brunei have been made by cession, annexation and purchase—the Trusan river in 1884, the Limbang in 1890, the Lawas in 1904. The territory of Brunei is now reduced to very small dimensions and the frontiers of Sarawak now reach to British North Borneo.

The only recent event of historical importance, the introduction of the new constitution in 1941, is mentioned below.

ADMINISTRATION

Sarawak is unique among British protectorates in that the home government appoints neither the ruler nor the administrative officers. From 1855 to 1941 the government of Sarawak consisted of the hereditary sovereign, the rajah, and two councils, the Supreme Council of nine (four Europeans and five Malay magistrates) and the Council Negri or Council of State, composed of about fifty European and native officials and native chiefs. The former was the sole legislative authority and the highest judicial tribunal, the latter consultative. Under a decree of 24 September 1941, the rajah began to rule through a constitution; under this both the former councils survive, the Supreme Council functioning as the rajah's executive council, the Council Negri as the legislative authority.

There is a civil service of about ninety British officials, appointed by the rajah and including departments of native affairs, Chinese affairs, labour, lands, trade and customs, public works, forestry, education and public health. Government of the native tribes is indirect and operates through native chiefs who are advised by district officers.

The country is divided into four Divisions, each in charge of a Resident. There is a Sarawak government agent and advisory council in London and a pilgrim officer is maintained at Jeddah.

There are Anglican and other missions. The seat of the Anglican bishop of Labuan and Sarawak is at Kuching.

POPULATION

The total population is estimated at about 450,000 (1936). It consists of 390 Europeans, mostly government officials, Malays, some 100,000 Chinese, a few Indians and the aboriginal tribes who form the great mass of the population. The last four sections of the population intermarry and cannot be sharply distinguished. A simplified form of Malay is the *lingua franca* of the country.

The Malays live chiefly on the coast and in the larger settlements. They are Muslims and provide a large proportion of the police and minor officials. The Sarawak Malays are somewhat different in dialect and in other characteristics from those of Brunei. They claim to have come from Menangkabau in Sumatra, but are of very mixed blood; some are partly of Arab descent. The Chinese, a large proportion of whom are engaged in trade and industry, are most numerous in the south-west of the country, in Kuching and in the Bau goldfield. They are also found in all the larger settlements, and Chinese traders penetrate up the rivers far into the interior. The Indians are largely Klings from Madras who came to the country originally as traders or coolies. Most of them now live in the towns.

The aboriginal tribes are similar to those of the rest of Borneo. They are conspicuously lighter-skinned than the Malays and many are little darker than a dark European. They are mostly pagan and differ considerably among themselves in language, customs and, to some extent, in physical characteristics. They are often all loosely termed Dyak, but six principal groups can be recognized: (1) the Sea Dyak or Iban, (2) the Kayan, (3) the Kenyah, (4) a heterogeneous group called the Klemantan, (5) the Murut, (6) the Punan. The Sea Dyak are the largest of these groups, and the best known to Europeans, as they live principally near the coast and on the lower reaches of the rivers. They are the most active, vivacious and warlike of the native tribes and were formerly inveterate head-hunters. Their language is similar to Malay.

All these tribes, except the Punan, who are shy nomads living in small groups in

the jungle, practise primitive rice cultivation and live in 'long houses' generally on the banks of rivers, one or more 'houses' constituting a village.

PRODUCTS AND TRADE

As has been stated, it has not been the first aim of the Sarawak government to seek a large revenue or to encourage large-scale industrial or plantation development of the country. Agriculture is almost entirely in native hands and the only industry in which much capital is invested is the oilfield, situated at Miri. Jungle products collected by the natives are of some importance.

The two most important products of the country are petroleum (including petroleum products such as gasoline and kerosine) and rubber. The first oil well was sunk at Miri in 1912 and by 1940 production, which is in the hands of Sarawak Oilfields Limited, a subsidiary of the Anglo-Dutch combine, had begun to decline and was about 422 tons a day. Exports of petrol and petroleum products were valued at \$10,705,282 in 1939. Miri has grown into a town of 10,600 inhabitants (1927), including 5,000 employees of the oil company, 300 of them being European. Rubber is grown in native plantations, mostly of small area; rubber exports amounted to \$15,384,928 in 1939.

Products of secondary importance are gold, mostly from alluvial workings in the neighbourhood of Bau on the upper Sarawak river, jelutong gum, pepper, sago, copra, fish, and timber. Small quantities of edible birds' nests, betel nuts, dammar, resin, palm oil, rattans, and tuba (derris) roots are also produced.

Not enough food for the population is grown and large quantities of rice, as well as other foodstuffs, are imported.

There is a considerable excess of exports over imports. In 1939 the value of exports was \$34,399,748 and of imports, \$26,173,420. Most of the trade is with Singapore. The tonnage of shipping entering and clearing ports in Sarawak in 1939 was 974,543.

FINANCE

The government derives its revenue chiefly from customs, monopolies, rents and mineral royalties. In 1939 the revenue amounted to \$4,762,532 and expenditure to \$4,200,269. There is no public debt. Currency is the Straits dollar (2s. 4d. in 1938).

COMMUNICATIONS AND PORTS

There are no railways in Sarawak and few roads, the total length of roads suitable for motor traffic only amounting to 101 miles in 1938. Most of these roads were in the Kuching district. Communications are mainly by sea and river, or by narrow and difficult jungle paths which can only be traversed on foot.

Kuching, Miri and Sibu are the chief ports. Kuching and Sibu are accessible to vessels drawing about 12 ft.; small repairs can be carried out at the former.

Steamers of the Straits Steamship Company call at Pending Landing (for Kuching) and at Miri and maintain communications with Singapore and British North Borneo. There are also coastwise services between the smaller ports. Many of the rivers are navigable for long distances inland by praus and small native craft, but most of them are impeded by rapids and sandbanks.

There are wireless stations at all the chief towns. A telephone system is in operation and there are also thirty-four post offices.

BIBLIOGRAPHICAL NOTE

There is no comprehensive work on Sarawak. The standard history is the interesting *History of Sarawak under its two white Rajahs* by S. Baring Gould and C. A. Bampfylde (London, 1909). O. Beccari, *Wanderings in the great forests of Borneo*, edited by F. H. H. Guillemard (London, 1904) gives an excellent picture of the country, mainly from the point of view of a naturalist. The best work on the native peoples is C. Hose and W. Macdougall, *Pagan tribes of Borneo*, 2 vols. (London, 1912). On geology see J. B. Scrivenor, 'Notes on the geology of Sarawak' *Journal of the Malayan Branch of the Royal Asiatic Society*, vol. v, pp. 288-296 (Singapore, 1927). 'The Oxford University Expedition to Sarawak, 1932' *Geographical Journal*, vol. LXXXII, pp. 385-410 (London, 1933) gives much information, especially about the natural history of northern Sarawak.

Appendix VII

BRUNEI

General Description

Brunei is a small native state, under British protection, situated on the north-west coast of Borneo. Its total area is about 2,500 sq. miles and consists of two separate territories both bordered round their entire land frontier by Sarawak. The terrain is hilly and drained by several rivers (Fig. 120).



Fig. 121. The town and bay of Brunei

Drawn from a photograph.

The town of Brunei, a typical Malay settlement consisting of wooden houses built on piles over the water and roofed with *atap* (palm thatch), stands at the mouth of the Brunei river. The background of green hills gives the place a picturesque appearance, but at low tide the evil smells which arise from the mud somewhat mar the enjoyment of the scene (Fig. 121).

History

The present State of Brunei is the remains of an historic native kingdom which was once rich and powerful and included the greater part of north-western Borneo.

Magellan's squadron visited the town of Brunei in 1521 and Pigafetta, the historian of the expedition, was much impressed by its wealth and the magnificence of the sultan's court. The town, now a place of little more than 10,000 inhabitants, was then supposed to contain 25,000 families; the barbicans on the wall round the royal palace mounted fifty-six cannon and the sultan was attended by richly caparisoned elephants. The splendours of the court have long passed away and Brunei now has little to distinguish it from other Malay towns.

The descent of the present sultan can be traced back for over twenty generations and is recorded in Malay characters on a limestone slab. The dynasty was founded in the fifteenth century by a sultan who took the name of Mohammed on his conversion to Islam. The third sultan, who married a niece of the first, came from Taif in Arabia and was a descendant of the Prophet. With the help of the Chinese he built an artificial bar across the mouth of the Brunei river. This was made by sinking forty junks filled with stone and part of it still exists. In the sixteenth century the Portuguese carried on much trade with Brunei and may have had a trading station there. Shortly afterwards the Spaniards attacked it and placed a sultan of their own choice on the throne. Though he did not hold it for long, the golden age of Brunei never returned.

In the eighteenth century the English East India Company had a trading post in the town of Brunei. By the early nineteenth century the affairs of the sultanate were at a very low ebb. The wealth of the country had long disappeared and the population had greatly diminished. The sultan's authority over most of his nominal dominions was non-existent and lawlessness and piracy prevailed everywhere. In 1840 Rajah Brooke was installed as governor of Sarawak (see p. 475) which had previously formed part of the sultan's territory. From then on Brunei suffered successive losses of territory until it reached its present insignificant size. In 1847 Great Britain concluded a Treaty of Friendship and Commerce with the sultan with the object of encouraging trade and checking piracy. In 1888 Brunei was declared a British protectorate.

Administration

Since 1906 the sultan has been obliged to hand over administration to a British Resident, acting as High Commissioner under the Governor of the Straits Settlements. The present status is similar to that of an unfederated Malay state.

Population

The total population of Brunei is 30,135 (1931), of whom the majority are Malays and Bornean aborigines (Kadayan, Orang Bukit and a few Murut).

Products and Trade

The chief products are petroleum (707,219 tons produced in 1938), natural gas, gambir and rubber. Sago, hides and horns, and brassware are also exported. The Brunei oilfield is at Seria and has been worked by the British Malayan Petroleum Co. since 1927. The crude oil is pumped to a refinery at Lutong in Sarawak, where the crude oil from the Miri field is also treated. Production in 1940 was about 2,420 tons a day. Considerable amounts of sago are grown in the river valleys, but little rice. The town of Brunei is the home of various native industries, such as brass and silver working and weaving of cloth embroidered with gold thread. The total value of exports was \$6,580,725 in 1938 and of imports \$2,821,799. The state revenue was \$1,179,979 in 1938 and the expenditure \$1,476,725.

Communications and Ports

Communications are mainly by sea or river; small vessels of the Straits Steamship Co. connect the town of Brunei with Labuan, whence larger vessels maintain a weekly service with Singapore. There are six post offices and three radio-telegraph stations.

Appendix VIII

LABUAN

General Description

Labuan ($5^{\circ} 16' \text{ N}$, $115^{\circ} 15' \text{ E}$), a small island about forty sq. miles in area, lies six miles off the coast of British North Borneo, immediately to the north of Brunei bay (Fig. 122). It is a British crown colony and is administered as a separate unit of the Straits Settlements, under a Resident.

Most of the island, which was originally forest-covered, has been cleared by felling and burning. About 10,500 acres are cultivated and there is much secondary forest. There is an extensive open plain on which a small breed of cattle is reared. There are no large wild animals. The birds include the interesting mound-builders or megapodes.

History

Labuan, like the neighbouring mainland, was once part of the kingdom of Brunei. In 1775, after their expulsion from Balambangan, the English East India Company tried to make it a trading station, but the attempt failed and the island became deserted and a resort of the pirates who terrorized the Borneo coast. On the initiative of Rajah Sir James Brooke of Sarawak and Admiral Sir Henry Keppel it was acquired by the British Crown in 1846. At that time there were high hopes that it might prove valuable as a coaling and refitting station for the navy. The new colony did not prove a financial success and in 1889 its administration was handed over to the North Borneo Company, whose chief officer became its governor. This arrangement was found to be unsatisfactory and in 1905 the administration was given to the government of the Straits Settlements, in which the colony was incorporated in 1907. Five years later Labuan became a separate unit under the same government.

When it first became a British colony Labuan was uninhabited, but by 1901 there was a population of 8,411; in 1934 this had dropped to 7,497. About half the inhabitants are Chinese; there are a few Malays and Europeans, the rest are Kadayan (Bornean aborigines).

Products and Trade

There are indications of oil on the island, and some coal, but it has not proved economical to work. The chief product is sago, but rice, rubber, coconuts and tropical fruits are also grown. The main importance of the place is as a market for the products of the neighbouring coast of Borneo and the Sulu islands. Exports in 1926 were valued at \$3,391,500 (£395,000) and imports at \$3,073,400 (£358,300). The revenues of the government come from harbour dues, rents and licences.

Communications and Ports

The only town on the island is the port of Victoria, which has a good harbour. Water is supplied from a reservoir owned by the government. The only bank is a post office savings bank. There is a lighthouse on the island of Pappan at the entrance to the harbour. There is cable communication with Singapore, British North Borneo and Hong Kong. The island has one main road which runs north-westward from Victoria.

Appendix IX

BRITISH NORTH BORNEO

GENERAL DESCRIPTION

British North Borneo has an area of 31,000 sq. miles; it occupies the northern part of the island from the Bengkulit river on the west, which divides it from Sarawak, to the centre of Sebatik island on the east, where it meets Dutch territory. The South China sea washes its western, the Sulu and Celebes seas its eastern coasts (Fig. 122).

Much of the country is mountainous, the higher ranges rising somewhat abruptly from a system of low hills. The hill country is intersected by valleys and occasionally by not very extensive plains. Much of the coast is low-lying and alluvial, with many creeks and swamps. The greater part of the southern frontier follows a mountain range and from this other ranges branch off with a general south-west-north-east trend. The largest of these ranges runs parallel to the west coast at a distance of about thirty miles from the sea. The huge granite mass of Kinabalu, 13,484 ft. high, the highest mountain in the Malay archipelago, forms part of this western range. Though surrounded by sheer precipices thousands of feet high, Kinabalu is not difficult to climb. The largest plain is in the valley of the Kinabatangan river, which runs into the sea close to Sandakan bay, on the north-east coast. This has an area of about 4,000 sq. miles and is very fertile.

The longest river is the Kinabatangan, which is navigable for 120 miles by launches drawing six feet. It enters the sea through an extensive delta and has three main exits, of which the Mumiang is the most used by shipping. On the Kinabatangan is the government station of Lamag. Other rivers of the north-east coast are the Labuk, the Sugut, and a number of smaller ones flowing into Murudu bay. The west coast rivers are short and mostly unnavigable. Among them is the Tempassuk, rising on Kinabalu; the government station of Kotabelud is near its mouth. The Putatan, south of Jesselton, winds tortuously through prosperous native rice plantations. The Papar also waters an important rice-growing district. The Padas, the longest river of the west coast, is navigable as far as Beaufort, sixty miles from the sea. On the south-east coast there are several large rivers of which the Segama is the chief; it is navigable by small launches for some sixty miles.

Like the rest of Borneo, much of the country is densely wooded. Most of the natural vegetation consists of tropical rain-forest and round the coasts there are extensive mangrove and nipah palm swamps. The flora is Indo-Malayan in character. Among a host of interesting orchids, ferns and palms, it includes a great variety of the pitcher plants, *Nepenthes*. On Kinabalu grows the remarkable *Nepenthes rajah*, the largest of its genus, whose huge pitchers hold three or four pints of water. The largest wild animals are elephants, rhinoceros and wild cattle. Elephants, which are found chiefly in the south-east of the country, are probably not native, but are the descendants of those presented to the sultan of Sulu many years ago. Wild cattle live mostly in open country in herds of considerable size, and the orang-utan is found in the forests in some places. Bird life is extraordinarily varied and includes many kinds of cuckoos, night-jars, trogons, rain-birds, woodpeckers, parakeets and doves. Hornbills, as elsewhere in Borneo, are common. The peculiar megapodes or mound-builders are found on the islands round the coast.

The climate is equable and hot and damp at all seasons of the year. The temperature on the coast rises to about 87° – 88° F. in the afternoon and falls to about 70° – 72° F. at night. In the hilly interior it becomes decidedly cool at night and in the early morning. The annual rainfall varies in different places from about

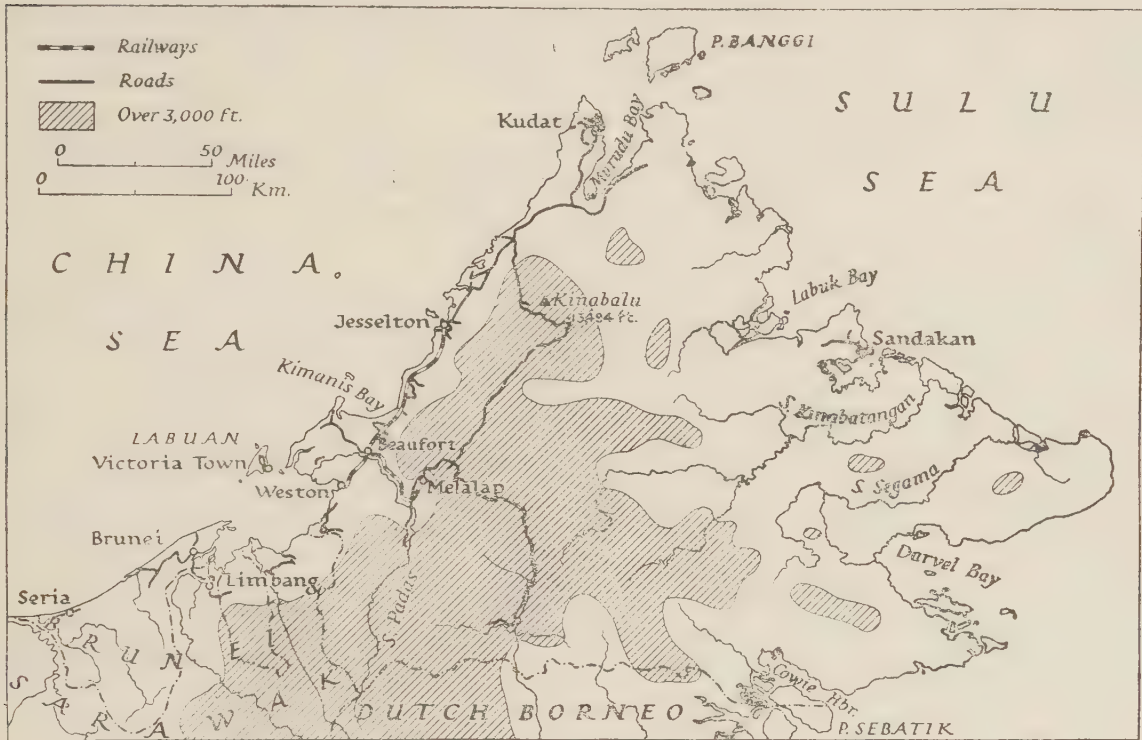


Fig. 122. British North Borneo

Source: 1 : 1,000,000 series (G.S.G.S. 4204).

60 to 180 inches. The wet season lasts during the north-east monsoon from October or November to January or February; the driest period is usually from February to May. During the wet season rain seldom falls uninterruptedly for more than twenty-four hours and some days are quite rainless. The dry season is broken by showers. Though enervating, the climate is not as unhealthy as that of many other tropical countries. Malaria is common, but much has been done to control it. Epidemics of smallpox and cholera, which were common before the British occupation, are now practically unknown.

HISTORY

The early history of British North Borneo is similar to that of Sarawak. There is evidence of Chinese influence at a remote period. Later, the territory formed part of the domains of the sultans of Brunei and Sulu.

In 1773 the English East India Company founded a trading station at Balam-bangan, an island to the north of Murudu bay. This island and part of the neighbouring mainland of Borneo had been granted by the sultan of Sulu to the traveller Alexander Dalrymple in 1756, as a reward for procuring his release from captivity in Manila. In 1769 the sultan sold all his North Borneo territories to the English East India Company. The settlement at Balam-bangan did not last long; in 1775 it was attacked by Sulu and Ilanun and the garrison was forced to flee to Brunei, leaving behind booty worth half a million pounds. In 1803 another attempt was made to found a settlement at Balam-bangan, but it was soon abandoned. Like

the neighbouring parts of Borneo, North Borneo was ravaged by piracy and lawlessness during the early years of the nineteenth century.

After 1843, when Rajah Brooke of Sarawak obtained from the British government the assistance of H.M.S. *Dido* in his campaign against the Borneo pirates, the coasts of North Borneo became the scene of many raids against pirate strongholds. In 1845 a fleet of warships destroyed the stronghold of Sherip Usman on Murudu bay and a little later that of Haji Saman on the Membakut river. Piracy did not cease till shortly before the government by the British North Borneo Company was established.

In 1847 the British government concluded a treaty of friendship with the sultan of Brunei. A similar treaty made in 1849 with the sultan of Sulu was not ratified owing to the objections of Spain. It was hoped that the treaty with Brunei and the opening of a free port at Labuan would promote order and good government throughout North Borneo. These hopes, however, were not realized. The United States followed the British example and entered into a treaty with the sultan of Brunei, appointing a consul. This consul, C. Lee Moses, in 1865 procured from the Brunei government three cessions of territory for himself, including most of the provinces now forming British North Borneo. These cessions were made in consideration for certain annual payments. Moses transferred his rights to the American Trading Company of Borneo, at the head of which was J. W. Torrey of Hong Kong. In November 1865, the sultan conferred sovereign rights on Torrey, appointing him 'Rajah of Ambong and Murudu'. The American company started a settlement and attempted planting and shipbuilding, but no serious attempt was made to govern the country, and the settlement was soon abandoned.

In 1872 the sultan of Sulu granted to W. C. Cowie, afterwards managing director of the British North Borneo Company, a site in Sandakan bay for trade with the Sulu islands. From this post the Labuan Trading Company, under the management of Cowie, carried on trade successfully for several years. About this time Baron Overbeck, Austrian Consul-General at Hong Kong, negotiated an agreement with the American Trading Company for acquiring the rights granted it by the sultan of Brunei. In seeking capital for his new enterprise the Baron appealed to Alfred Dent of the firm of Dent and Company of Hong Kong. Dent agreed to join in the scheme provided he was given the chief control. With his associates Dent concluded agreements with the sultans of Brunei and Sulu which eventually led to the cession of the whole of North Borneo. In 1878 Dent returned to England and applied to the government for a charter, which was eventually granted in 1881.

Following the grant of the charter the British North Borneo Company was formed with a nominal capital of £2,000,000. The new company undertook the government of the country and proceeded to develop its trade. From 1890 to 1905 the company also undertook the administration of Labuan. Except for minor rebellions, the subsequent history of British North Borneo, until the Japanese occupation between December 1941 and January 1942, has been uneventful. North Borneo became a British protectorate in 1888, when the sovereign rights of the North Borneo Company were recognized.

ADMINISTRATION

The government of British North Borneo is administered by a governor, who acts under the authority of the court of directors of the British North Borneo Chartered Company in London. The appointment of the governor is subject to the approval of the Secretary of State for the Colonies. Under the governor there is a government secretary and a civil service of about 100 British officers. All legislation is passed by a legislative council which consists of eight official and five unofficial members. The laws are based on the Indian codes of criminal and civil procedure, with in addition an elaborate system of native law administered by native courts.

The country is divided into four districts, Sandakan and Kudat, West Coast, Interior, and Tawau Residencies, each in charge of a resident. Each Residency is subdivided into districts with a district officer or assistant district officer. Appeal from the decisions of the native courts can be made to the district officer, from him to the resident, and ultimately to the governor. Ordinances are enacted by the governor on the advice of the legislative council, but the court of directors of the Company has a right to veto ordinances similar to the power of veto of the Crown in Crown colonies.

There is an armed constabulary of about 500 Indians and Bornean natives under European officers.

POPULATION

The total population of North Borneo was estimated to be 288,388 in 1928; it was 257,804 at the last census (1921). The country is scantily and unevenly populated and vast tracts of country in the interior and on the east coast are uninhabited.

A great many ethnic groups are present. The most numerous are the two chief aboriginal races, the Dusus and the Murut, and the Chinese. Besides these there are smaller numbers of Malays, Bajau, Ilanun, Kadayan, Bisaya, and Sulu. The European population is about 400. The Dusun are a widely distributed and heterogeneous group of people. They are lighter-skinned than most of the Bornean races and better agriculturalists. They show Chinese influence in their customs, but it is uncertain how far this is due to an actual admixture of Chinese blood. The Murut live mainly in the hills of the interior. Though not sharply distinguished from the Dusun, they are more restless in nature, more primitive in habits and customs and less advanced in their methods of cultivation. In some districts they have only recently been persuaded to give up head-hunting.

The Chinese, as in Malaya, are chiefly traders, gardeners and artisans. They are proving a most important factor in the agricultural and industrial development of the country and the government has actively encouraged Chinese immigration. In 1928 over a thousand state-aided Chinese settlers came to the country in addition to unassisted immigrants.

PRODUCTS AND TRADE

North Borneo is not a country of great mineral wealth, comparing unfavourably in this respect with the other parts of Borneo. The chief resources of the country are agricultural and forest produce.

Coal is found at Weston on the west coast, in Murudu and Sandakan bays and in the country behind Cowie Harbour. In the last-named place the coal is mined and conveyed by rail to a wharf from which it is taken by lighter to depots on Sebatik island and at Sandakan. The coaling facilities at these two places have attracted much shipping which would not otherwise have visited the country. There are indications of oil at several places, but so far it has not been found in sufficient quantities to justify extensive operations. Small quantities of gold and other minerals are found.

The climate is suited to the cultivation of most tropical crops and there is fertile soil in many parts of the country. The crops which have been most important hitherto have been tobacco and rubber. Tobacco was for many years the chief product of North Borneo, but its importance has diminished and rubber is now the largest export.

Tobacco cultivation under European direction was begun about 1883 and an attempt was made to emulate the wrapper-leaf industry of the Deli district in Sumatra. The first experiments in this direction were successful and a boom in

tobacco cultivation soon developed. Though the local conditions were undoubtedly suitable for the cultivation of wrapper-leaf, the industry later encountered various difficulties and is now of little importance. Rubber-growing, which was also introduced in the eighties, has become firmly established. At the end of 1928 thirty companies with a capital approaching £4,000,000 were engaged in it and the total area planted reached 96,037 acres. Rubber exports in 1928 amounted to 15,003,412 lbs.

The most important food crop is rice, which is the staple diet of the country. On an average about 40,000 acres of 'wet' rice and about 30,000 acres of hill or 'dry' rice are planted yearly. The government has introduced regulations with the object of stopping the wasteful *ladang* system of cultivation, an important matter in North Borneo where timber is one of the main assets of the country. Many other tropical crops are grown—sugar-cane, coffee, pepper, cassava, and maize—but excepting coconuts not on a large scale. Sago replaces rice as the staple food of the natives in some districts of the west coast. Oil palms, manila hemp, sisal, and kapok grow well but have not yet been developed on a large scale.

Timber is the most important forest product. There are believed to be over 2,000,000 acres of commercial forests within twenty miles of the coast, producing up to 3,000 cu. ft. per acre. The most abundant timber is *seriah*, or Borneo cedar, a soft, light wood of a reddish colour. There are also good supplies of *belian* or Borneo ironwood, a very hard and durable wood. Other hard, heavy timbers are plentiful. In 1920 a company was formed to exploit the timber resources of the country. The chief market for timber is Hong Kong, but Australia, Great Britain, Japan and the United States also import timber from North Borneo.

Rattans, dammar, gutta percha, Borneo camphor and tan bark obtained from mangrove trees are among the minor forest products.

Exports in 1939 amounted to \$13,453,318, imports to \$6,498,292.

FINANCE

The finances of British North Borneo are somewhat different from those of most colonies in that the government is a commercial company which must pay dividends. The revenue in 1939 was £416,701 and the expenditure £226,666. The currency is the Straits dollar (2s. 4d. in 1938).

COMMUNICATIONS AND PORTS

The largest town is Sandakan, a port with a magnificent harbour. It is the headquarters of several of the government departments and of the leading commercial firms. It has electric light and power, a good water supply and many other amenities of civilization. The population was nearly 14,000 in 1939, of whom 9,000 were Chinese. Other towns are Jesselton (pop., 8,453, including the surroundings), the chief port of the west coast, Papar, a small but prosperous place also on the west coast, Beaufort on the Padas river about fifty-six miles from Jesselton, Tenom, two hours by train inland from Beaufort, Kudat on Murudu bay, Lahad Datu on Darvel bay and Tawau on Cowie Harbour (Plates 128, 129).

A metre-gauge railway runs along the west coast from Weston on Brunei bay to Beaufort and thence to Jesselton; another line connects Beaufort with the inland towns of Tenom and Melalap. The latter line traverses picturesque mountainous country and its construction offered many difficult engineering problems. The average number of passengers carried during the period 1924–28 was 270,650 per annum. Goods carried over the same period averaged 15,330 tons per annum. There is a daily service of trains on the Beaufort–Jesselton section.

Roads are few. One from Jesselton to Tuaran, twenty miles distant, was completed in 1924 and road construction has been begun from Melalap, the rail terminus in the interior, to Keningau and also from Sandakan to Labuk. A number of other roads have been projected, but road construction has proved expensive and in future it is intended to build roads of a less high grade than those so far constructed. In the interior and west coast residencies the lack of roads is to some extent compensated for by a system of good bridle paths. The longest of these runs from Tenom to Ranau, a distance of 115 miles, and thence to Kota Belud and the small port of Usukan. Tuaran and Kota Belud are linked by bridle path with Murudu bay.

The Straits Steamship Company runs a weekly service from Singapore to North Borneo, calling at Jesselton, Kudat and Sandakan. The journey from Singapore to Sandakan takes about four and a half days. Another company maintains services between the smaller ports. There is a steamship service about twice a month between Sandakan and Hong Kong and monthly services from Sandakan to Australia, Manila, Hong Kong and Japan. A Dutch company runs a service between Tawau and ports in Dutch Borneo.

There are post offices at Jesselton, Beaufort, Tenom, Kudat, Sandakan, Lahad Datu, and Tawau. Postal facilities are also available at all stations where there is a government office. There are telegraph lines connecting Jesselton, Beaufort, Tenom and Mempakul. These are connected with the cable station at Labuan, owned by Cable and Wireless Ltd., by a short submarine cable. There are wireless stations at Sandakan, Jesselton, Kudat, Tawau, Silimpopon, Lahad Datu and Lamag. The two main telephone exchanges are at Sandakan and Jesselton; the former is automatic. All stations in the interior are linked up with the Jesselton system by means of long-distance lines.

BIBLIOGRAPHICAL NOTE

The chief work of reference on British North Borneo is the official *Handbook* (last edition, London, 1934). O. Rutter, *British North Borneo* (London, 1922) is a comprehensive work. On the native peoples O. Rutter, *The Pagans of North Borneo* (London, 1929) and I. H. N. Evans, *Studies in religion, folk-lore and custom in British North Borneo and the Malay Peninsula* (Cambridge, 1923) should be consulted. Agnes Keith, *Land below the wind* (London, 1939) gives a vivid and readable account of the country.

Appendix X

PORTUGUESE TIMOR

General Description

Portuguese Timor consists of the eastern half of the island of Timor, the enclave of Ocussi (Okusi)-Ambeno and Poelau Kambing; it has an area of about 7,450 sq. miles. The country is mountainous, particularly along the boundary with Dutch Timor, and is, in general, similar to the Dutch part of the island (see pp. 277-9 of vol. I of this Handbook). The highest point is Fatamailau, 9,580 ft., in the Rameau range.

The fauna and flora have a distinct Australasian character, though there is only one marsupial. There is a well-marked dry season and, consequently, much savanna country. The soil is scanty and agriculture primitive, with little irrigation.

History

The earliest recorded discovery of Timor by Europeans is the visit of a Spanish vessel in 1522, though it is possible that the Portuguese had visited it a little earlier. It was settled by the Portuguese, who established a few posts in various parts of the island; they were, however, expelled from Koepang by the Dutch in 1613. During the eighteenth century there were frequent conflicts between the Dutch and the Portuguese. An attempt at a settlement was made by the treaty of 1859 which, however, left numerous enclaves on both sides of the frontier and led to still further disputes. A mixed commission was set up and a simplified boundary, together with the elimination of all but one of the enclaves, was agreed to in the treaty of 1893. This treaty in addition provided that all future disputes should be settled by arbitration and that each power should favour the nationals of the other in granting concessions, thus virtually excluding all foreign nationals.

Administration

Until 1896 Timor was joined with Macao in China under one governor, but was made an independent province in that year, an arrangement which was confirmed in 1926. The province is under the control of a governor and the budget must receive the approval of the Ministry for the Colonies, but otherwise there is local financial and administrative autonomy.

Population

The population in 1936 was 463,796, the great bulk of whom were Timorese. There are very few Europeans apart from officials, the great majority of whom live in the capital, Dilli. There are a certain number of Chinese, Boeginese and Arabs in the coastal districts. The Timorese are a mixed race, probably of Malayo-Papuan-Polynesian ancestry. There are small Roman Catholic communities and a few Muslims on the coast; inland the people are little touched by civilization, and are said to practise polygamy and concubinage.

Products and Trade

Copra, hides, coffee, cocoa beans and wax are the chief products which are exported. A certain amount of sandalwood is also obtained from the interior of the

island. Maize, and, to a lesser extent, rice, is grown for food. The chief imports are cotton piece-goods, petroleum and wine. In 1937 exports were about four times as great as the imports.

Finance

The estimated revenue and expenditure balanced in 1939 at 12,804,119 escudos.

Communications and Ports

Dilli (Dilly), which lies on the north coast, is the only port of any importance. This is also the chief town and administrative headquarters, but is a poor place with about 3,000 inhabitants. In 1937 fifty-eight ships of 100,729 tons entered and cleared the port. The majority of the vessels calling at Dilli are Dutch, though a small Portuguese vessel maintains communications with Koepang.

There is a good road system of about five hundred miles, confined almost entirely to the northern part of the island. The main road running south-westward from Dilli connects with the road system of Dutch Timor at Caxias de Extremo, on the frontier, and provides a through connection to Koepang. There is a telephone system and a wireless station at Dilli.

CONVERSION TABLES

METRIC AND BRITISH UNITS

It is customary to think of the ‘metre’ and the ‘yard’ as representing unalterable units of length. This is not so. The metre was originally intended to be the 10,000,000th part of the earth’s meridional quadrant. But the accurate determination of this length proved to be extremely difficult—partly for technical reasons, and partly because of different conceptions of the ‘figure of the earth’. In view of these difficulties it became necessary to define the length of the metre in terms of suitable metal bars measured under specified conditions of temperature, pressure, humidity, etc. Similar standard bars were also used to define the length of other units such as the yard. As all these metallic standards are subject to change, conversion tables differ according to the date of comparison between different bars. The tables that follow are based on the comparison between the yard and the metre made in 1895. This made 1 metre equivalent to 39.370113 in.

Metric System. List of Prefixes

- Deca means ten times.
Hecto means a hundred times.
Kilo means a thousand times.
In abbreviations the Decametre, etc., is Dm., and the decimetre, etc., dm.
- Deci means a tenth part of.
Centi means a hundredth part of.
Milli means a thousandth part of.

Note on ‘Nautical’, ‘Geographical’ and ‘Statute’ miles

A British ‘nautical mile’ is the length of the minute of the meridian at any given latitude, and is therefore a variable unit. It is given in feet for Clarke’s 1880 spheroid by the formula:

$60771.1 - 30.7 \cos 2 \text{ Lat.}$

This is the sea mile of the scale of latitude and distance of the Admiralty Charts. From the above formula it will be found to vary from 6,046.4 ft. at the equator to 6,107.8 ft. at the poles, being 6,077.1 ft. at latitude 45°.

The so-called ‘international nautical mile’ of 1,852 m. or 6,076 ft. is the length of the minute of the meridian at latitude 45° on the international spheroid. This corresponds to the 6,077 ft. for Clarke’s spheroid.

A ‘geographical mile’ is a fixed unit, being defined by some as the length of a minute of the equator and by others as that of the minute of the meridian at latitude 45°. According to the former definition its value on Clarke’s spheroid is 6,087 ft. and according to the latter 6,077 ft. The round figure 6,080 is usually adopted for the purposes of ordinary navigation.

The British ‘statute mile’ measures 5,280 ft.

LIST OF CONVERSION TABLES

	PAGE
1. Length	491
2. Area	491
3. Yield per Unit Area	491
4. Volume and Capacity	492
5. Weight	492
6. Temperature: Equivalents of Fahrenheit and Centigrade Scales	493
7. Pressure: Equivalents of Millibars, Millimetres of Mercury, and Inches of Mercury at 32° F. in Latitude 45°	494

Table 1. Length

Nautical mile	Statute mile	Kilometre	Metre	Yard	Foot	Inch	Centimetre
1	1.152	1.853	1853	2027	6080*	72,960	185,300
0.8684	1	1.60934	1609.34	1760	5280	63.360	160,934
0.5396	0.621372	1	1000	1093.61	3280.84	39,370.1	100,000
0.0005396	0.0006214	0.001	1	1.09361	3.28084	39.3701	100
0.0004934	0.0005682	0.0009144	0.914399	1	3	36	91.4399
0.0001645	0.0001894	0.0003048	0.3048	0.33333	1	12	30.48
0.0000137	0.0000158	0.0000254	0.0254	0.02778	0.083333	1	2.54
0.0000054	0.0000062	0.00001	0.01	0.0109361	0.032808	0.393701	1

* This is the customary British practice, and not the ‘international nautical mile’, which Great Britain has not adopted.

Table 2. Area

Square mile	Square kilometre	Hectare	Acre	Square metre	Square yard
1	2.58998	258.998	640	2,589,980	3,097,600
0.386103	1	100	247.106	1,000,000	1,195,990
0.003861	0.01	1	2.47106	10,000	11,959.9
0.0015625	0.0040469	0.404685	1	4046.85	4840
0.00000039	0.000001	0.0001	0.000247	1	1.19599
0.00000032	0.00000084	0.0000836	0.000207	0.836126	1

Table 3. Yield per Unit Area

Tons per acre	Metric tons per hectare	Quintals per hectare
1	2.51071	25.1071
0.398294	1	10
0.0398294	0.1	1

Table 4. *Volume and Capacity*

Kilolitre	Cubic metre	Cubic yard	Bushel	Cubic feet	Imp. gall.	Litre	Pint
1	1.000027	1.30799	27.4969	35.3157	219.976	1000	1759.80
0.999973	1	1.30795	27.4962	35.3148	219.970	999.973	1759.75
0.764532	0.764553	1	21.0223	27	168.178	764.532	1345.43
0.0363677	0.0363687	0.0475685	1	1.28435	8	36.3677	64
0.028316	0.028317	0.037037	0.778602	1	6.22882	28.3160	49.8306
0.0045460	0.0045608	0.0059461	0.125	0.160544	1	4.54596	8
0.001	0.001000	0.001308	0.027497	0.035316	0.219976	1	1.75980
0.0005682	0.0005683	0.0007433	0.015625	0.020068	0.125	0.56824	1

Table 5. *Weight*

Ton	Metric ton or millier	Quintal	Kilogram	Pound
1	1.01605	10.1605	1016.05	2240
0.984207	1	10	1000	2204.62
0.0984207	0.1	1	100	220.462
0.0009842	0.001	0.01	1	2.20462
0.0004464	0.0004536	0.004536	0.453592	1

Table 6. Temperature: Equivalents of Fahrenheit and Centigrade Scales

°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.
100	37.7	79.25	26.25	58	14.4	37.4	3	17	8.3	—	—20
99.5	37.5	79	26.1	57.2	14	37	2.7	16.25	8.75	—	—20.5
99	37.2	78.8	26	57	13.8	36.5	2.5	16	8.8	—	—21
98.6	37	78	25.5	56.75	13.75	36	2.2	15.8	9	—	—21.1
98	36.6	77	25	56	13.3	35.6	2	15	9.4	—	—21.25
97.25	36.25	76	24.4	55.4	13	35	1.6	14	10	—	—21.6
97	36.1	75.2	24	55	12.7	34.25	1.25	13	10.5	—	—22
96.8	36	75	23.8	54.5	12.5	34	1.1	12.2	11	—	—22.2
96	35.5	74.75	23.75	54	12.2	33.8	1	12	11.1	—	—22.5
95	35	74	23.3	53.6	12	33	0.5	11.75	11.25	—	—22.7
94	34.4	73.4	23	53	11.6	32	0	11	11.6	—	—23
93.2	34	73	22.7	52.25	11.25	31	—0.5	10.4	12	—	—23.3
93	33.8	72.5	22.5	51.8	11.1	30.2	—1	10	12.2	—	—23.75
92.75	33.75	72	22.2	51	11	30	—1.1	9.5	12.5	—	—23.8
92	33.3	71.6	22	50	10.5	29.75	—1.25	9	12.7	—	—24
91.4	33	71	21.6	49	10	29	—1.6	8.6	13	—	—24.4
91	32.7	70.25	21.25	48.2	9.4	28.4	—2	8	13.3	—	—25
90.5	32.5	70	21.1	48	9	28	—2.2	7.25	13.75	—	—25.5
90	32.2	69.8	21	47.75	8.8	27.5	—2.5	7	13.8	—	—26
89.6	32	69	20.5	47	8.73	27	—2.7	6.8	14	—	—26.1
89	31.6	68	20	46.4	8.3	26.6	—3	6	14.4	—	—26.25
88.25	31.25	67	19.4	46	8	26	—3.3	5	15	—	—26.6
88	31.1	66.2	19	45	7.7	25.25	—3.75	4	15.5	—	—27
87.8	31	66	18.8	44.5	7.5	25	—3.8	3.2	16	—	—27.2
87	30.5	65.75	18.75	45	7.2	24.8	—4	3	16.1	—	—27.5
86	30	65	18.3	44.6	7	24	—4.4	2.75	16.25	—	—27.7
85	29.4	64.4	18	44	6.6	23	—5	2	16.6	—	—28
84.2	29	64	17.7	43.25	6.25	22	—5.5	1.4	17	—	—28.3
84	28.8	63.5	17.5	43	6.1	21.2	—6	1	17.2	—	—28.75
83.75	28.75	63	17.2	42.8	6	21	—6.1	0.5	17.5	—	—28.8
83	28.3	62.6	17	42	5.5	20.75	—6.25	0	17.7	—	—29
82.4	28	62	16.6	41	5	20	—6.6	—0.4	18	—	—29.4
82	27.7	61.25	16.25	40	4.4	19.4	—7	—1	18.3	—	—30
81.5	27.5	61	16.1	39.2	4	19	—7.2	—1.75	18.75	—	—30.5
81	27.2	60.8	16	39	3.8	18.5	—7.5	—2	18.8	—	—31
80.6	27	60	15.5	38.75	3.75	18	—7.7	—2.2	19	—	—31.1
80	26.6	59	15	38	3.3	17.6	—8	—3	19.4	—	—31.25

Table 7. *Pressure: Equivalents of Millibars, Millimetres of Mercury, and Inches of Mercury at 32° F. in Latitude 45°*

Mercury in.	Milli- bars	Mercury mm.	Mercury in.	Milli- bars	Mercury mm.	Mercury in.	Milli- bars	Mercury mm.	Mercury in.	Milli- bars	Mercury mm.
27.02	915	686.3	27.82	942	706.6	28.62	969	726.8	29.41	996	747.1
27.05	916	687.1	27.85	943	707.3	28.65	970	727.6	29.44	997	747.8
27.08	917	687.8	27.88	944	708.1	28.67	971	728.3	29.47	998	748.6
27.11	918	688.6	27.91	945	708.8	28.70	972	729.1	29.50	999	749.3
27.14	919	689.3	27.94	946	709.6	28.73	973	729.8	29.53	1,000	750.1
27.17	920	690.1	27.97	947	710.3	28.76	974	730.6	29.56	1,001	750.8
27.20	921	690.8	28.00	948	711.1	28.79	975	731.3	29.59	1,002	751.6
27.23	922	691.6	28.03	949	711.8	28.82	976	732.1	29.62	1,003	752.3
27.26	923	692.3	28.05	950	712.6	28.85	977	732.8	29.65	1,004	753.1
27.29	924	693.1	28.08	951	713.3	28.88	978	733.6	29.68	1,005	753.8
27.32	925	693.8	28.11	952	714.1	28.91	979	734.3	29.71	1,006	754.6
27.35	926	694.6	28.14	953	714.8	28.94	980	735.1	29.74	1,007	755.3
27.38	927	695.3	28.17	954	715.6	28.97	981	735.8	29.77	1,008	756.1
27.41	928	696.1	28.20	955	716.3	29.00	982	736.6	29.80	1,009	756.8
27.44	929	696.8	28.23	956	717.1	29.03	983	737.3	29.83	1,010	757.6
27.46	930	697.6	28.26	957	717.8	29.06	984	738.1	29.86	1,011	758.3
27.49	931	698.3	28.29	958	718.6	29.09	985	738.8	29.89	1,012	759.1
27.52	932	699.1	28.32	959	719.3	29.12	986	739.6	29.92	1,013	759.8
27.55	933	699.8	28.35	960	720.1	29.15	987	740.3	29.94	1,014	760.6
27.58	934	700.6	28.38	961	720.8	29.18	988	741.1	29.97	1,015	761.3
27.61	935	701.3	28.41	962	721.6	29.21	989	741.8	30.00	1,016	762.1
27.64	936	702.1	28.44	963	722.3	29.24	990	742.6	30.03	1,017	762.8
27.67	937	702.8	28.47	964	723.1	29.26	991	743.3	30.06	1,018	763.6
27.70	938	703.6	28.50	965	723.8	29.29	992	744.1	30.09	1,019	764.3
27.73	939	704.3	28.53	966	724.6	29.32	993	744.8	30.12	1,020	765.1
27.76	940	705.1	28.56	967	725.3	29.35	994	745.6	30.15	1,021	765.8
27.79	941	705.8	28.59	968	726.1	29.38	995	746.3	30.18	1,022	766.6

INDEX

- Abulfatah, sultan, 55
 Accounts Law (1864), 86, 106, 107, 326
 Achin, *see* Atjeh
 Adiwerno, 139
 Administration, 86, 98, 104-29;
 numbers employed in, 131 (table);
 see also Legal system
 Aerodromes, civil, 349, 354, 359, 370,
 379, 384, 397, 453, 455, 465
 Africa, steamship services to, 446
 Agar-agar, 230
 Agathis forest, area under, 235 (table)
 Agave, exports of, 172 (table)
 Agoeng, sultan, 54
 Agrarian Law (1870), 86, 215, 220, 287
 Agriculture, 6-31 *passim*, 169-232 (figs.
 and plates); *see also* individual crops,
 Labour, Land Tenure, Livestock,
 Plantations
 Air (river), *see under* proper name
 Airbangis, 61
 Airlangga, king, 42
 Air mails, 457-8
 Alang-alang, 236, 237
 Alang, Tandjoeng, 395
 Albuquerque, Alfonso du, 47
 Alcohol, 9, 20, 276
 Alfoer, 26
Algemeene verordeningen ('general regu-
 lations'), 86, 106, 115
 Alor islands, 2, 31
 Amangkurat I, sultan, 54, 55
 Amangkurat II, sultan, 55, 56
 Amboina, 26, 27, 47, 48, 50, 52, 66, 71,
 82, 152, 163, 460; 'Massacre of'
 (1623), 53; port, 341 (table), 395,
 386 (fig.), 397 (and plate)
 Amiens, treaty of (1802), 72
 Amoentai, 389
 Amoerang, 411
 Ampatlawanger, 16
 Amphitrite bay, 374
 Anaikloof, 433 (plate), 437
 Anglo-Dutch treaty, of 1824, 82-83, 87;
 of 1871, 87, 88
 Anglo-Saxon Petroleum Company, 448
 Ani-ani, 174
 Anjeh, 400
 Antjol Junction, 421
 Arabs, 43, 168, 488
 Arau, Batang, 383, 437
 Architecture, 11 (plate), 12 (and plate),
 13 (plate), 41, 454
 Areca nuts, 199, 440; exports of, 301
 (table)
 Areng (*Arenga saccharifera*), 192
 Arit, 174
 Arnhem, tin smelting at, 263, 309
 Aroe islands, 65, 230
 Asahan, Soengai, 146, 373, 374
 Asphalt, 249 (fig.), 256, 258, 259 (table),
 399, 400, 405
 Assam tea bug (*Helopeltis*), 197
 Association of Java Sugar Producers,
 192, 309, 310
 Atap, 230
 Atjeh, 52, 59, 60, 81, 83, 88, 123 (fig.),
 148, 211, 370, 405, 408, 439, 440;
 peoples of, *see* Atjeher; subjugation
 of, 19, 91-3, 417
 Atjeher, 4, 13, 19-20 (plate)
 Atjeh Hoofd, 368
 Atjeh, Kroeëng, 370
Atjeh Staat Spoorweg (A.S.S.), 370,
 439 (and plate), 440
 Australia, air services to, 465, 466; steam-
 ship services to, 446
 Australoid type, 2
 Austro-Asiatic, linguistic family, *see*
 South-East Asiatic
 Austronesian languages, 4, 5
 Aviation, civil, 465-6; *see also* Aero-
 dromes, civil
 Baabullah, king, 48
 Babalan, Soengai, 370
 Babat, 257
 Babatan, Soengai, 379
 Babi island, 343
 Badoei, 2, 13
 Bagansiapiapi, fishing industry at, 226,
 230, 239
 Bagoeskoening, 377, 379
 Bahau, 23
 Bali, 115, 132, 151, 178 (plate), 179
 (plate), 207, 208, 214, 227 (plate);

- history, 42, 43, 59, 65, 82, 89, 94;
 irrigation in, 176, 177; peoples of, *see*
 Balinese; roads, 411 (fig.); *see also*
 Lesser Soenda islands
- Bali-Aga, 30, 31
 Bali and Lombok, residency of, 123
 (fig.)
 Balikpapan, 149, 278, 391, 409, 460;
 oilfield near, 257, 258 (table), 259
 (table); oil refinery, 259 (table), 390,
 391; port, 341 (table), 388 (fig.),
 389-90 (fig. and plates)
 Balinese, 2, 3, 8 (plate), 11, 28-30
 (plates)
 Bamboo, 8, 17, 18, 21, 24, 25, 174, 239,
 269, 272, 273, 449
 Bananas, 208
 Banda islands, 47, 48, 50, 52 (and plate),
 66, 71, 115, 152
Bandeng (Chanos chanos), 231
 Bandjar, 22, 429
 Bandjermasin, 149, 162, 163, 213, 409;
 port, 341 (table), 387, 388 (fig.),
 sultanate of, 62-3
 Bandoeng, 36, 111, 275, 278, 282, 307
 (plate), 420, 422 (plate), 423, 429,
 460, 461 (table), 465, 466; cinchona
 factory, 200 (and plate), 453; general
 description, 453 (and plate); popula-
 tion, 139, 161, 162, 163
 Bangka, 40, 41, 80, 90, 148, 167; area
 under forest, 235 (table); peoples of,
 16; residency of, 123 (fig.); roads,
 408; tin mines, 260-4 *passim*
 Bangkalan, 145
 Bangka Tin Company, 252, 264
 Banjoemas, residency of, 118 (fig.)
 Banjoewangi, 145, 402, 420; port, 341
 (table), 364 (fig.), 365
 Bank Line, 445, 446
 Bank of Formosa, 333, 471
Bank Nasional Indonesia, 333
 Banks and banking, 219, 220, 325, 332-4
 Bantam, 134, 136, 177 (table), 206, 404;
 residency, 118 (fig.), 273; sultanate,
 47-62 *passim*, 67, 73, 75
 Banteng (*Bos sondaicus*), 206
 Banyan tree, 29
 Barat winds, 342, 395
 Barber Line, 445, 446, 447
Baris, Balinese dance 28, (plate), 29, 30
 Barisan range, 438
 Barito, Soengai, 149, 387, 409
 Baroe, Kali, 352, 353, 354 (plate)
- Baroemen, Soengai, 374
 Baroes, 61
Barong, Balinese dance, 28 (plate), 30
 Basep, 24
 Bastian, Adolph, 3
Bataafsche Petroleum Maatschappij
 (B.P.M.), 255 (table), 257, 258, 259
 (table), 345, 359, 367, 371, 388, 390,
 392, 460
 Batagau strait, 391
 Batak 2 (plate), 4, 13, 16-18 (plate),
 94, 208
 Batak plateau, 147, 386, 407, 455
 Batang (river), *see under* proper name
 Batavia, 35, 55, 56, 66, 74, 108, 109
 (plate), 111, 163, 227 (plate), 276,
 282, 307 (plate), 343, 402, 416, 420,
 421, 423 (plate), 425; founding of, 52,
 53 (and plate), 54; general descrip-
 tion, 345 (fig.), 346-7, 348 (and
 plate), 349 (plates); industries, 278,
 348; population, 135, 161; port, *see*
 Tandjoengpriok; residency of, 118
 (fig.)
 Batavian Republic, 69, 70, 71
Bataviasche Bank, 333
 Batavia transport railway, 419 (table),
 433
 Batik working, 9, 271, 272 (fig. and
 plates), 454
 Batjan island, 47
 Batoe, 148
 Batoeradja, 417
 Bauxite, 249 (fig.), 250, 264, 265 (plate),
 336; exports of, 306
 Bedadoeng river, irrigation works, 177
 (table)
 Bekasi, 136 (fig.), 426
 Beket, 24
 Belawan, port, 154, 339, 341 (table),
 371-3 (fig. and plates), 417, 441, 446,
 447, 455; Soengai, 159 (plate)
 Belgian Congo, agreement with, 309
 Belinjoe, 341 (table), 379 (fig.), 380
 Benda gap, 428, 453
 Bengawan (river), *see under* proper name
 Benkoelen, 19, 53, 60, 77, 78, 80, 82,
 147, 407; residency of, 16, 123 (fig.),
 155, 156, 250
 Berastagi, 158 (plate)
 Berbak, Batang, 375
 Berhala strait, 375
 Besitang, railway junction, 439 (plate)

- Besoeki, 67, 198; residency of, 118 (fig.), 210
- Bestuurpolitie*, 128
- Betel nut, 9, 20, 211; cultivation, 199, 213; exports of, 172 (table)
- Betingtjamar, Tandjoeng, 371
- Beverages, manufacture of, 275-6; imports of, 304 (table)
- Bila, Soengai, 374
- Bilian*, see Ironwood forests
- Billiton, 80, 81, 83, 88, 90, 148, 167; area under forest, 235 (table); peoples of, 16; roads, 408; tin mines, 260-4 *passim* (plate)
- Billiton Tin Company, 252, 264; founding of, 88, 262
- Bindjai, 147
- Bintan island, 250, 264 (and plate)
- Birth-rate, 153, 164
- Blambangan peninsula, 145
- Blandong* system, 242
- Blitar, 420
- Blue Funnel Line, 442, 443, 445, 446, 448
- Bodha, 30, 31
- Bodjonegoro, 431; residency of, 118 (fig.), 210, 268
- Boeboe*, 226
- Boedi Oetomo*, 96, 99, 100
- Boeginese, 22, 24-25, 488; pirates, 62, 64, 74, 81
- Boekit (hill), see under proper name
- Boekit tribe, 24
- Boekit Asem coalfield, 252, 265, 266, 421, 434, 435, 436
- Boela bay, 152, 460; oilfield, 258, 259
- Boemiajoe, 141
- Boenjoe, Poelau, oilfield, 257
- Boeroe, Poelau, 26, 63
- Boetoeng, Poelau, 63, 258
- Bonaparte, Louis, 72
- Bonaparte, Napoleon, 73, 77
- Bondojoedo river, irrigation works, 177 (table)
- Bondowoso, 402
- Bonfia, 2
- Bongaya Contract (1663), 64
- Boni, kingdom of, 63, 64, 81, 82
- Bonthain, 150, 411
- Borneo, British North, 476 (and plates), 482, 483 (fig.), 484-7
- Borneo, Dutch, administration, 115, 116, 117 (table), 122, 123 (fig.); agriculture, 213; forests, 233-9; *passim*, 245; history, 62-3, 81, 87, 89, 94; industries, 276 (table), 278, 279; livestock, 205-8 *passim*; mining, 81, 88, 247, 250, 265, 266, 267; oilfields, 254, 255 (table), 257, 258 (table); peoples, 2, 3 (plate), 22-4; population, 130 (table), 132, 148-50, 157, 163 (table), 166 (table); ports, 340 (fig.), 341 (table), 386-90; roads, 405, (plate), 408, 409 (fig.)
- Borneo Camphor, 238
- Borneo Canal, 345
- Borneo ironwood (*Eusideroxylon Zwageri*), 238
- Borneo Olie Maatschappij*, 255 (table), 257, 336
- Boroboedoer, Buddhist *stupa*, 11 (plate), 12 (and plate), 13 (plate), 41, 454
- Boschdistricten*, 243
- Bosch, Johannes van den, Governor-General, 84, 215, 216, 300, 304
- Botanical Garden, Buitenzorg, 193, 195, 218, 453
- Brantas, Kali, 140, 142 (fig.), 144 (fig.), 402, 428, 454; irrigation works, 177 (table), 178; railway bridge over, 430 (plate)
- Breadfruit, 208
- Brewing, 276
- Brick making, 279
- Brine springs, 257
- Briquette factory, 348
- British India Steam Navigation Company, 445
- Broadcasting, 463
- Bronze, casting of, 15
- Brooke, James, Rajah, 87, 474, 475, 480, 481, 484
- Brunei, 87, 474, 475, 479 (fig.), 480, 483 (fig.)
- Buddhism, 12, 38-42 *passim*, 451-2
- Budget, 325-30
- Buffaloes, 205 (table); in rice cultivation, 174
- Buitenbepatti*, 67
- Buitengewesten, see Outer Provinces
- Buitenzorg, 108 (and plate), 111, 139, 162, 163, 402, 420, 428; botanical garden, 193, 195, 218, 453; general description, 453-4; residency of, 118 (fig.), 268
- Bureau for Popular Reading, 10, 36, 37
- Burma, steamship services to, 445
- Burns-Philp line, 344, 446

Butter, 275

Cables, submarine, 459-60

Camphor, 68

Canoes, outrigger, 22, 227-30 (plate)

Cantala, 199

Capellen, Baron van der, Governor-General, 78, 79, 84

Capital investments, 90, 297, 335-7

Cassava, 172, 180, 425; area under, 179 (table), 210; cultivation, 201, 202 (fig.), 213; exports of, 172 (table), 299 (table), 300, 301 (table), 306, 347, 350, 353, 358, 359, 367; factories, 275

Cassiterite, 260, 261

Casuarina forest, area under, 235 (table)

Cattle, 13, 25, 145, 205-6 (table)

Caucasoid stock, *see* Nescot

Celebes, administration, 115, 123 (fig.), agriculture, 213-4; forests, 233-40 *passim*; history, 63-4, 81-2, 94; live-stock, 205-8 *passim*; mining, 248, 250, 258, 267; peoples, 2, 4, 19 (plate), 24-6; population, 130 (table), 132, 150, 157, 163 (table), 166 (table); ports, 340 (fig.), 341 (table), 191 (plate), 392-5, 396 (plate), 397 (plate); roads, 405 (plate), 410 (fig.), 411

Cement, 250, 266, 437; exports of, 347; imports of, 304 (table), 320; manufacture, 273 (plate), 278, 348, 354

Central Cash Bureau, 219

Central Commission for Emigration and Colonization, 156

Central Union, 294

Ceram, 65, 115, 248; oilfield, 255 (table), 258 (table), 259 (tables); peoples, 2, 26

Chartered Bank of India, Australia and China, 333

Cheese, 275

Chemicals, imports of, 304 (table), 306; manufacture of, 278

Cheribon, 54, 55, 56, 73, 75, 135, 162, 268, 279; port, 341 (table), 349-50 (fig.); residency of, 118 (fig.)

Chilachap, *see* Tjilatjap

Chile, commercial agreement with, 322; steamship services to, 446

China, air services to, 466; steamship services to, 445

China and Southern Bank, 333

China clay, *see* Kaolin

Chinese, 15, 22, 56, 57, 63, 68, 73, 77, 83, 110, 126, 165-7, 219, 288, 289, 291, 292, 333, 347, 471, 481, 485; distribution of, 166 (fig.); mining colonies, 81, 88; nationalism, 95-6; numbers, 130 (table), 165, 166 (table); occupation groups, 131 (table), 132; schools, 31-4 *passim*, 95; traders, 297, 298, 302, 322

Chocolate, manufacture of, 275

Christian Ethical Party, 98

Christianity, 15, 16, 22, 25, 26, 31, 48

Chung Wah Bank, 333

Cigarettes, 9, 272, 273, 279, 329

Cinchona, 90, 316, 471; cultivation, 200 (and plates); exports of, 172 (table); 300 (table), 301 (table), 315, 316 (table); production, 179 (table), 315; *see also* Quinine

Cinnamon, exports of, 172 (table)

Citronella oil, 203, 277; exports of, 301 (table)

Citrus fruits, 208

Civil service, 104, 114, 119, 122

Clay, building, 250

Clothing, manufacture of, 277

Cloves, 9, 48; cultivation, 198, 214; export, 172 (table), 397

Coal, 147, 149, 247, 248, 250, 264-6, 345, 353, 356, 367, 369, 379, 438, 440, 485; exports of, 378, 384; fields, 249 (fig.), 264, 265-6 (plate); imports of, 348, 358; production, 248 (fig.)

Coca leaf, 200-1; exports of, 172 (table); production, 179 (table)

Cocoa, 203, 217; exports of, 172 (table); production, 179 (table)

Coconuts, 147, 149, 150, 151, 152, 425, 455; cultivation, 194-5, 212 (fig.), 213, 214; exports, 172 (table)

Coen, Jan Pieterszoon, 52, 53, 347

Coffee *arabica*, 196, 197

Coffee *liberica*, 196, 197

Coffee *robusta*, 196, 197

Coffee, 15, 68, 73, 85, 86, 147, 150-2 *passim*, 215, 216, 217, 223, 336, 337, 454; cultivation, 196-7, 213, 214; exports of, 172 (table), 299 (table), 300, 301 (table), 358, 378, 394; production, 179 (table), 317.

Coffee-sergeants, 67

Coinage Act (1912), 106

Cola kingdom, 43

College of Commissioners, 118

- College of Delegates, 113-14
 College of Deputies, 117
 Colonization Council, 157
Comité Penjadar Barisan, 101
 Commerce, 296-323; growth of, 90;
 numbers employed in, 131 (table)
 Communications, air, 365-6; land,
 399-441; sea, 442-50
 Communications and Public Works,
 Department of, 114, 339, 340, 417,
 456
 Communism, 95, 96, 98
 Communist Party (P.K.I.), 99
 Concessions, agricultural, 220-3
 Confectionery, manufacture of, 275
 Consolidated Tin Smelters Limited, 263
 Coolie Ordinance, of 1880, 288; of
 1936, 292
 Copper-smelting, native, 454
 Copra, 214, 277, 425; exports of, 194,
 299 (table), 300, 301 (table), 305,
 374, 386, 394, 395, 397; production,
 179 (table), 195
 Cotton, 73, 199, 471; imports of, 303
 (table), 304 (table), 305, 374; mills,
 276, 277
 Council of Natural Science, 217
 Council of the Indies, *see Raad van*
 Nederlandsch-Indië
 Courts, law, 125-8
 Cranes, 345, 350-7 *passim*, 369-90
 passim, 393
 Cransen, 74
 Credit, 219-20, 332-4, 471
 Cremation rites, 29
 Crisis Ordinance, (1933), 318, 319,
 320, 321
 Crops, chief, 178-205
 Culture System, 7, 9, 84-5, 192, 196,
 203, 214-5, 223, 242, 284, 285, 286,
 287, 327, 400
Cultuurgebied, 90, 146, 197, 198, 206,
 211, 212 (fig.), 213, 285, 288, 408, 455
 Currency, 324-5
 Custard apples, 208
 Customs & Excise, revenue from, 331
 (table)
 Cutch, 68, 203-4

 D'Abreu, Antonio, 47
 Daendels, Herman Willem, Governor-
 General, 72-3, 75, 81, 85, 242, 347,
 400, 453, 456
 Dairy produce, 275, 320

 Dajangdajangan, Poelau, 392
Dalang, 11
 Dammar, 239, 317
 Dancing, 10, 27, 28 (plate), 29 (and
 plate)
 Death-rate, 153, 164
 De Brito, 46
 Debt, state, 329, 330 (fig.)
 Decentralization Law (1903), 97
 Dekker, Eduard Douwes, 85, 86
 Deli, 87, 93, 156, 211, 212 (fig.), 216
 Deli Bank, 333
 Deli leaf, 198
 Deli Planters Association, 289
 Deli Railway, 417, 440 (plates), 441
 Deli Tobacco Company, 90, 417
 Demak, 46, 276, 431; irrigation works
 at, 177
 De Molukken, *see* Moluccas
 Denmark, commercial agreement with,
 321
 Denpasar, 151, 306 (plate)
 Depression, world economic, 157, 265;
 effects on agriculture, 192, 194, 210,
 222; effects on industry, 271, 273-4,
 280, 286; effects on trade, 306-7
 Derat oilfield, 255
Desa, 97
Desadiensten, 287, 288
 Dewantoro, 100
 Dharmavamça, king, 42
 Diamonds, 247, 249 (fig.), 250, 266, 471
 Diet, native, 180 (fig.), 181 (figs.)
 Dijëng plateau, 141
 Dilli, 489
Diospyros, 238
 Dip nets, 225
 Dipo Negoro, 83, 84
 Dipterocarp forest, 238; area under,
 235 (table)
 Divisions (*afdeelingen*), 117, 122
 Djailolo, 47
Djaksa, 127
 Djambi, oilfield, 256 (fig.), 257, 258
 (table); port, 146, 340, 341 (table),
 375, 376 (fig.); residency of, 16,
 123 (fig.), 211, 408; sultanate of, 93
Djatibosschen, 236
 Djatiroto, sugar factory, 274
 Djember, 145, 268; railway workshop,
 423
 Djoewana, 415
 Djogja, Javanese dance, 10
 Djomblang, 353

- Dobo, 230
 Dodwell-Castle Line, 445, 446, 447
 Doewoer, Goenoeng, 143 (fig.), 426
 Donan, Kali, 365
 Drama, 10-11, 29
 Dredgers, bucket, 262, 263
 Drift nets, 226
 Drug plants, 200
 Dry docks, 346, 353, 357, 381, 386
 Du Bus de Gisignies, Count, 79, 84
 Duizend-eilanden, 343
 Durian, 208
 Dutch, colonial policy, 74, 75, 115-7;
 early influence, 49, 50, 52, 53-69;
 numbers, 164 (table); *see also under*
 East India Company
 Dyak, 4, 22, 23, 208, 213, 474, 475, 476

 East Coast Residency, *see* Oostkust
 East India Company, Dutch, 49-70
 passim, 84, 104, 215, 237, 242, 247,
 300; English, 49, 50, 73, 74, 77, 480,
 481, 483; French, 50
 Economic Affairs, Department of, 114,
 218
 Edam island, 343
 Education, 31-7; expenditure on, 329
 Education and Religion, Department
 of, 114
 Electric power, 280-3 (tables)
 Ellerman Bucknall Line, 448
 Emigration, 155-7, 289
 Emmahaven, 147, 266, 339, 341 (table),
 383 (fig.), 384, (and plate), 436, 437
 Enggano island, 148; peoples of, 21, 22
 Engineering, 278-9
 Enim river, bridge over, 404 (plate)
Erfpacht, 221 (table)
 Ethical System, 7, 97
 Eucalyptus forest, area under, 235
 (table), 244
 Eurasians, *see* Indos
 Europe, air services to, 465, 466; steam-
 ship services to, 447-8
 Europeans, 115, 125, 126, 157, 162-5;
 early influence of, 47-69; legal status,
 164; nationalities, 164 [(table);
 numbers, 130 (table), 163 (table);
 occupation groups, 131 (table), 132,
 163
 Evergreen forest, area under, 235
 (table), 236, 238
 Expenditure, 326 (table), 327, 329
 (table)

Exploitatie en Handel Maatschappij
voorheen F. Buning, 268
 Exports, 172 (table), 296 (fig.), 297 (fig.),
 298-303, 305, 306, 347; origin of,
 302 (table), 303; regulation of, 308-18

 Fakfak, 151
 Federation of Industry and Commerce,
 217
 Fendall, John, 77, 81
 Fertilisers, imports of, 303 (table),
 304 (table), 305
 Fibres, 277, 471; cultivation, 199;
 exports of, 172 (table), 300 (table),
 301 (table)
 Finance, 324-38, 471; *see also* Banks and
 banking, Budget, Capital investments,
 Currency, Taxation
 Finance, Department of, 114
 Firestone Tyre and Rubber Company,
 337
Fiscaal griffier, 126, 127
 Fisheries, 8, 9, 16, 21, 25, 27, 224-32
 (plates), 348 (plate); fresh-water,
 231-2; sea, 224-31
 Fish ponds, 145, 158 (fig.), 231, 232
 Floating docks, 346, 347, 356, 357,
 358 (plate), 369
 Flores, 31; population, 151; roads,
 412 (fig.)
 Foodstuffs, manufacture of, 275-6
 Forced Deliveries and Contingencies,
 67, 68
 Foreign Orientals, 115, 125, 126;
 numbers, 130 (table); occupation
 groups, 131 (table), 132
 Forestry Service, 239, 244, 245, 246
 Forests, 233-46; administration, 242-6;
 and population density, 234 (fig.);
 area under, 233, 235 (table); economic
 value, 237-42; reserves, 235 (table),
 241, 243, 244, 245
 Fort de Kock, 147
 Fort van der Capellen, 147
 Free Labourer Ordinance (1911), 291
 French Revolutionary Wars, effect of,
 69, 70
 Fruits, 151, 152, 208
 Fukien, Chinese from, 165
 Fu-nan, 39
 Fundamental Law (*Grondwet*), 105, 106,
 107

 Gajah Mada, 44

- Gajo, 4, 18, 223, 238
 Gambir, 148, 480; cultivation, 203-4, 211; export, 172 (table), 375; production, 179 (table)
 Gamelan, Javanese orchestra, 9 (plate), 10-11
 Gandasoeli, 41
 Garoet, 138 (fig.), 139, 277, 402
 Gasoline, *see* Petroleum
Gecommitteerden, 118
 Gedeh, Tandjoeng, 377
Gedeputeerden, *see* College of Deputies
 Gedongtataan, 155
 Gembong, Kali, 359
 Gemutu fibre, 199
 General Agricultural Syndicate, 217
 General Association of Rubber Planters of East Sumatra (A.V.R.O.S.), 289
 General Deli Emigration Office, 289
 General Experimental Station for Agriculture and Industry, 218
 General Industrial Mining and Exploitation Company, 268
 General Motors Limited, assembly plant, 347 (plate)
 General Popular Credit Bank (*Algemeen-volkscredietbank*), 219, 471
 General Syndicate of Sugar Manufacturers, 192
Gerakan Rajkat Indonesia, 101
 Germany, commercial agreement with, 321, 322
 'Germinal system' of colonization, 156
Gewesten, 116, 117 (table)
 Gianjar, 94
 Giesting-Colonization, 157
 Gili Genteng island, 363
 Gillespie, Colonel, 74
 Gill netting, 225, 226
 Glandesa, 390
 Goats, 208
 Goebeng railway workshops, 422 (plate), 423, 428
 Goeng, river, irrigation works, 177 (table)
 Goenoeng (mountain), *see under* proper name
 Gold, 247, 250, 252, 267
 Goodyear Tyre and Rubber Company Limited, 278, 337
 Gorontalo, 150, 411, 444 (plate)
Gourami (*Osphromenus olfax*), 232
 Government, *see* Administration
 Government Marine, 448
 'Governments', 98, 116
 Governor-General, 52, 66, 72, 73, 77, 84, 86, 93, 97, 98, 110, 111, 112, 117, 125, 254, 292, 453, 467; palace of, 108 (plate); powers of, 105, 106, 107, 108-9
 Gowa kingdom, 63, 64, 65
 Grammar schools, *see* *Lycea*
 Grapefruit, 208
 Grassland, area under, 235 (table)
 Great Britain, 71, 72, 82, 101, 102; commercial agreement with, 309, 321; occupation of Java by, 73-7; trade with, 306
 'Great Post Road', 400
 Grissee, 12, 44, 46, 47, 269
 Groote Oost, 116, 117 (table), 122, 123 (fig.), 394
 Groundnuts, *see* Peanuts
 Group-Committees (*Groepgemeenschap*), 122, 124
 Guava, 208
 Gujerat, 46
 Gunny bags, 277
 Gutta percha, 172 (table), 179 (table); exports of, 301 (table)
 Hadhramaut, Arabs from, 168
 Halmahera, 5
 Hamburg-Amerika Line, 447
 Hari, Batang, 146, 375, 376
 Hat making, 9, 273
 Head-hunting, 18, 22, 23, 25, 26, 27
 Headman, village, 7, 17, 76, 119, 120, 121, 128
Hemileia vastatrix, 196
Herendiensten, 120, 287, 288
Hevea brasiliensis, 193; *see also* Rubber
 High Court of Justice (*Hooggerechtshof*), 125
 Hinduism, 7, 13, 16, 28, 38, 40, 46, 451
 History, 38-103; before 1800, 38-69; since 1800, 69-103
 Hoevell, W. R. van, 85
 Hogendorf, Dirk van, 71, 74, 76
 Ho-ling, *see* Kaling
 Holland, *see* Netherlands
 Hollandia, 152
 Holt Line, *see* Blue Funnel Line
 Hong Kong, steamship services to, 445, 446; trade with, 305
 Hong Kong and Shanghai Banking Corporation, 333

- Hoogere Burger Scholen* (H.B.S.), 32, 33, 34, 35, 36
 Horses, 31, 207-8
 Horticulture, 208-9
 Houses, 8, 14, 17, 18, 19, 21, 23, 24, 25, 27, 29
Houtvesterijen, 243
 Hurgronje Snouck, Professor, 91, 92, 115

 Ibn Batuta, 46
 Ice factories, 275, 276, 320
 Ijang-gebergte, 145
 Immigration, 154, 155 (table)
 Immigration Chamber, 290
 Import Licensing Ordinance (1935), 322
 Imports, 296 (fig.), 297 (fig.), 298 (table), 303-4, 305, 306, 347; regulation of, 318
 Indaroeng, cement works at, 273 (plate), 278, 437
 Inderagiri, Soengai, 20, 374
 India, early cultural influence, 38, 39-41
 Indian Club, 99
 Indian Party, 96
 Indigo, 68, 85, 203, 215, 216, 223
Indische Staatsregeling (1925), 98, 105, 107, 116, 121
Indisch Verslag, 105, 106
 Indo-China, 309, 311; steamship services to, 445
 Indo-European Union (*I. E. Verbond*), 157
 Indonesians, 3, 4; languages, 5
 Indonesian Society, 99
 Indos, 96, 99, 164
 Indramajoe, 420
 Indrapoeri, 92
 Industry, electric power in, 282; European, 273-9; miscellaneous, 279; native, 9, 15, 24, 29, 271, 272 (fig.), 273, 454; numbers employed in, 131 (table)
 Industries Law (1927), 328
Insulinde, 99
 Internal Administration, Department of, 114
 International Rubber Regulation Committee, 314
 International Tin Committee, 308, 309
 International Tin Pool, 308, 309
 Iodine, 250, 257, 267
 Iron, 247, 249 (fig.), 250, 267; imports of, 303 (table), 304 (table)
 Ironwood forests, 236
 Irrigation, 15, 29, 174, 175-8 (plate)
 Islam, 6, 12, 16, 22, 24, 26, 39, 99, 101, 452; spread of, 45 (fig.), 46-47; *see also* Muslims
 Italy, commercial agreement with, 321, 322
 I-tsing, 40

 Jacatra, 52, 53, 54, 347
 Janggala kingdom, 42, 43 (fig.)
 Jansen's Channel, 355
 Janssens, Jan Willem, Governor-General, 73, 74
 Japan, immigrants from, 95, 154, 298, 333, 336; occupation by, 470-1; relations with, 93, 101-3, 467-9; trade with, 306, 321, 468-9
Jaring, 226
 Java, administration, 115, 117, 118 (fig.); 119-21; agriculture, 90, 169-205 *passim* (and plates), 209-10; fisheries, 224-32 *passim* (and plates); forestry, 233-46 *passim*; history, 38-103 *passim*; industries, 271-83 *passim*; labour in, 155, 156, 284, 285, 286-8; land tenure, 220-4; mining, 268, 259; oilfields, 254, 255 (table), 257, 258 (table), 259 (table); peoples, *see* Javanese; population, 130 (table), 132, 133, 134-45 (figs.); ports, 340 (fig.), 341 (table), 343-67 (figs. and plates); railways, 414 (table), 415-17, 418-33 (figs. and plates); roads, 399-404 (figs. and plate); settlements, 157-60; towns, 131, 135, 453-5 (and plates)
 Java and Madoera, administration, 117-21; population, 130 (table), 132, 152, 153 (fig.), 163 (table), 166 (table); *see also* Java, Madoera
 Java Bank, 79, 101, 325, 332, 333 (table), 471
 Java Canal, 344, 346
Java-China-Japan Lijn, 342, 345, 348, 356, 443, 445
 Java-Chinese War (1741-3), 57
 Javanese, 2, 4, 6-8 (plate), 9-13
 Javanese Succession War, 56, 59
 Java War (1825-30), 83-4
 Jelutong, 239
Jermal, 226, 227, 230

- Jesselton, 476 (plate), 486, 487
 Jogjakarta, 9, 141, 161, 162, 198, 420, 423, 426, 430; general description, 453 (plate), 454; sultanate of, 11, 59, 67, 73, 74, 75, 83, 84, 115-8 *passim*, 134, 140 (fig.), 141, 250
 Johore, 61, 62, 81
 Justice, *see* Courts, Legal System
 Justice, Department of, 114
 Jute, 277

 Kai islands, 65
 Kajan, 23
 Kalang, 2, 13
 Kalasei, Tandjoeng, 394
 Kali (river) *see under* proper name
 Kalianget, 341 (table), 362, 363 (fig.)
 Kaling, 40
 Kalisat, 402, 420
 Kamal, 433
 Kambangan, Noesa, 365
 Kampar-kiri, Soengai, 146
 Kandangan, 149
 Kaolin, 250
 Kapoean (Blora), oil refinery, 259 (table)
 Kapoeas, Soengai, 149, 257, 386, 409
 Kapoer, 238
 Kapok, 194, 199, 214, 359, 432; exports of, 172 (table), 301 (table), 317, 353; production, 179 (table), 199, 317
 Karang, Oedjoeng, 385
 Karangasem, 94
 Karangbolong, 268; Oedjoeng, 365
 Karo, 16, 17
 Kartini, Raden Ajeng, 96
 Kartosero, 141
 Kauri pine (*Agathis*), 240
 Kawah Poetih, 250, 268
 Keboemen, 141
 Kediri, 142, 402; kingdom, 42, 43 (fig.); residency of, 118 (fig.), 210, 237
 Kediri railway, 419 (table), 432
 Kedoe, 40, 118 (fig.), 454
 Kenja, 23
 Keppel, Sir Henry, 475, 481
 Kerintji, Goenoeng, 147
 Kerosine, *see* Petroleum
 Kertanagara, king, 44
 Kertapati, 377, 378, 379, 434, 435
 Kertosono, 428
 Ketapang, 149, 360, 409
 Keting electric power station, 282 (table)
Ketjak, Balinese dance, 29, 30
 Kinabalu mountain, 482
 Kite angling, 225 (fig.)
 Kite-flying, 22
 Klabat bay, 380
 Klah, Poelau, 368
 Klakah, 402
 Klamono oilfield, 258
 Klaten, 141, 426
 Klaveness Line, 446
 Kleine Soenda eilanden, *see* Lesser Soenda islands
 Kodjo Canal, 345
 Koeboe, 2, 21
 Koedoes 12, 118, 162, 454
 Koepang, 65, 151, 460, 461 (table)
 Koetaradja, 91, 148, 370, 407, 417, 439
 Komering, Air, 377, 379, 407, 435
 Kongsî, 81, 88
 Koninginne bay, 383
 Koninklijke Luchtvaart Maatschappij (K.L.M.), 465, 466
 Koninklijke Nederlandsche-Indië Luchtvaart Maatschappij (K.N.I.L.M.), 349, 359, 379, 389, 391, 394, 397, 453, 455, 465, 466 (table)
 Koninklijke Paketvaart Maatschappij (K.P.M.), 279, 342, 344, 346, 348, 350, 356, 370, 393, 443, 444 (and plate), 445, 446, 457, 460
 Kotabaroe, 149, 439
 Kotawaringen, 63
 Kratak electric power station, 282 (table)
 Krawang, 54, 55, 118; irrigation works 117 (table)
 Krawang, Oedjoeng, 343
 Krijan, 144 (fig.), 428, 432
Krijgsraden, 128
 Kroë, 19
 Kroeëng (river), *see under* proper name
 Kroja, 420, 423, 425, 426, 428, 429
 Kuching, 472, 474, 475 (plate), 476, 477
 Kwantung, Chinese from, 165

 Laboehan, 402
 Laboehanbilik, 341 (table), 374
 Labour, 154, 155, 284-95
 Labuan, 87, 480, 481
 La Corona Petroleum Maatschappij, 448
 Ladang, *see* Shifting cultivation
 Lagoendi island, 53
 Lahat, 407, 434, 435, 436
 Lamadjan electric power station, 282 (table)
 Lampegan tunnel, 428

- Lampoeng, residency of, 61, 123 (fig.), 146, 155, 156, 211
- Lamponger, 13, 18-19
- Landraad*, 126
- Land tenure, 7, 9, 17, 24, 76, 220-4
- Langkat, 87
- Languages, 3, 4 (and fig.), 5
- Laoet, Poelau, 149, 157, 213; coal mines, 252, 265
- Law, *see* Legal System
- Leather manufacture, 279
- Lebak, 137
- Legal system, 124-8
- Lematang, Air, 379
- Lembang, 138
- Lesser Soenda islands, forests, 233, 235 (table), 236; history, 65, 82, 94; peoples, 2, 4, 28-31; population, 130 (table), 150-1, 163 (table), 166 (table); roads, 411 (fig.), 412 (fig.); *see also* under individual islands
- Lho Me, Oedjoeng, 368
- Liberal professions, numbers employed in, 131 (table)
- Liberal Regime, 7, 85-6, 89-90, 305
- Libraries, 36-37
- Limes, 208
- Limestone, 250
- Lingga archipelago, 148
- Lingkars, 341 (table), 391-2 (and fig.)
- Linschoten, Jan Huyghen van, 49
- Lirik oilfield, 256
- Literature, 10, 15, 16, 17, 20, 25, 29
- Livestock, 205-8
- Locomotives, 419 (table), 421, 422, 423, 424, 430, 433, 434 (table), 434, 437, 440, 441
- Loeboe, 21
- Loesi, Kali, 402
- Lombok, 208, 214; administration, 115; history, 59, 65, 82, 94; peoples, 2, 3, 30-1; population, 132, 151; roads, 411 (fig.); *see also* Lesser Soenda islands
- Lompobatang, Goenoeng, 150
- London, Convention of, (1814), 77, 80
- London Sugar Convention (1937), 311
- London, treaty of, (1891), 94
- Lontar (*Borassus flabellifer*), 192
- Losari, Tandjoeng, 349
- Lycea*, 33
- Macassar ebony, 238
- Machinery and machine tools, 278; imports of, 303 (table), 304 (table), 305
- Madioen, 142, 177 (table), 402, 423, 428; residency of, 118 (fig.), 210, 237
- Madoera, 54, 56, 57, 67, 210, 250; administration, 117-21; cattle rearing, 206, 207; peoples, 4, 13; population, 145; railways, 270, 419 (table), 433; roads, 404; salt-pans, 269; *see also* Java
- Magelang, 141, 454
- Mahabharata*, 10, 11, 42
- Mahakam, Soengai, 257, 389
- Ma Huan, Chinese Muslim, 45, 46
- Maize, 13, 15, 22, 145, 150, 151, 152, 211; area under, 179 (table), 202 (fig.), 210; cultivation, 201, 213, 214; exports of, 172 (table), 301 (table), 306, 394
- Majapahit kingdom, 10, 44, 45 (fig.), 46, 47, 474
- Majang proas*, 225, 226, 228
- Majong river, irrigation works, 177 (table)
- Makassar, 52, 63, 64, 66, 74, 132, 150, 154, 162, 163, 230, 339, 411, 417, 447, 449; port, 341 (table), 342, 391 (plate), 392-4 (and figs.), 296 (plates)
- Makassar region, peoples of, 24-25
- Malacca, 45, 46, 47, 48, 62, 71, 73, 74, 82, 83; capture of (1641), 50, 54
- Malacca strait, 342, 442
- Malang, 142, 279, 282, 402, 420, 454 (and plate); residency of, 118 (fig.), 210
- Malang steam-tramway, 419 (table), 432
- Malayoe (Djambi), 40, 44, 45, 42, 61
- Malays, 3, 4, 13, 22, 26, 31, 213, 475, 476, 480, 481, 485; Coastal, 13, 15-16
- Malek Ibrahim, 46
- Manado, 63, 82, 150, 411, 460; port, 340, 341 (table), 342, 394-5 (and fig.), 397 (plate), 411, 460; residency of, 123 (fig.), 163
- Mandarese, *see* Boeginese
- Mandau, Soengai, 20
- Manganese, 249 (fig.), 250, 268, 471
- Manggarai railway workshops, 423, 425, 428
- Mangkoe Negoro, 59, 84, 455
- Mangoes, 208
- Mangosteen, 208

- Mangrove forest, 236; area under, 235 (table)
 Manokwari, 152
 Mantoeng, electric power station, 282 (table)
 Manufactured goods, imports of, 319-20
 Maoemere, 151
 Maos, 420, 429, 430 (plate), 423
 Marapi, Goenoeng, 147, 407, 439
 Marco Polo, 44, 46
 Marengan, Kali, 363
 Margarine manufacture, 277
 Marl, 250
 Martapoera, 63, 88, 407; Soengai, 387
 Mas, Kali, 354, 355, (and plate), 356, 358
 Mataram kingdom, 41-2, 54-61 *passim*, 67, 454
Max Havelaar, 86
 Medan, 121 (plate), 147, 162, 282, 290, 417, 441, 455, 440 (plates), 460; general description, 454 (plate), 455
 Meester Cornelis, 72, 135, 347, 425; *see also* Batavia
 Megalithic monuments, 22, 25, 27, 31
 Melanesian languages, 5
 Melati, 141
 Meloeloen, Poelau, 391
 Melons, 208
 Menado, *see* Manado
 Menangkabau, peoples, 2 (plate), 4, 13-15, 16, 18 (plate), 176; state, 60, 80
 Mendalan, electric power station, 282 (table)
 Mendoet, Tjandi, 13 (plate), 41
 Menes, 136
 Menggala, 146
 Mentawai island, peoples of, 21
 Merak, 420, 435
 Merapi, Goenoeng, 141, 159 (fig.), 160, 404, 426, 454
 Meratoes-gebergte, 149, 388, 409
 Merauke, 152; Papuan from, 3 (plate)
 Mercantile marine, 442-50 *passim*
 Messageries Maritimes, 448
 Meulaboh, 148, 408
 Midden-Java, province of, 98, 116, 117, 118 (fig.), 353
 Millet, 201
 Minahasa region, 64, 150; peoples of, 26
 Mineral resources, 247-70; distribution of, 249 (fig.), 250
 Mines Law (1899), 106, 251
 Mining, 247-70 (figs. and plates), 282
 Minto, Lord, 73, 74
 Miri, 260, 475 (plate), 477
 Missionaries, 31; Christian, 48, 51 (fig.); Islamic, 46
 Mitsui Bank, 333
 Mixed Deciduous forest, 236; area under, 235 (table)
 Modjokerto, 428
 Modjokerto railway, 419 (table), 432
 Modoeng, Tandjoeng, 354
 Moearaenim, 257, 379, 407, 434, 436
 Moearaklingi, 379
 Moearakompeh, 61
 Moearatebo, 376, 407
 Moentilan, 141
 Moerjo, Goenoeng, 139
 Moesi, Air, 146, 377, 378, 379
 Mogoi oilfield, 258
 Mohammedans, *see* Muslims
 Molasses, 425; exports of, 172
 Moluccas, administration, 116, 123 (fig.); forests, 233, 235 (table); history, 47-53, 74, 82, 89; peoples, 2, 5, 26-7; population, 130 (table), 151-2, 163 (table), 166 (table); ports, 340 (fig.), 341 (table), 392, 395-7 (and plate); *see also under* individual islands
 Monetary system, 324-5
 Mongoloid type, 3, 4
 Mongols, 44
 'Monkey dance', *see Ketjak*
 Monopolies, regulation of, 315-17; revenue from, 327
 Moslems, *see* Muslims
 Mother-of-pearl, 230
 Motor vehicles, 412, 413 (table); imports of, 304 (table), 305
Muhammedya, 96, 100, 101
 'Mulo' schools, 33, 34, 35
 'Multatuli', 86
 Municipalities, 161; government of, 121
 Muntinghe, 74, 78, 79, 84
 Muntok, 148, 408
 Music, 10, 29
 Muslims, 6, 9, 13, 15, 16, 18, 19, 20, 21, 26, 30, 31, 80, 127, 474, 476; nationalists, 96
Nagarakrtagama, 10
Nanyo Yusen Kaisya, 445
 Nassau, Fort, 52 (plate)

- Natal, 53, 61, 77, 80, 88
 National Bank of Indonesia, 220
 Nationalism, 10, 32, 95-6, 98-101
 Native Benches, *see* Landraad
 Natural gas, 257
 Natural increase, 153-4
Navigatio ac Itinerarium, 49
 Nederburgh, 71
Nederlandsche Handels Maatschappij (N.H.M.), 90, 307 (plate), 332, 333 (table), 335; and Culture System, 85; founding of, 79
Nederlandsche Koloniale Petroleum Maatschappij (N.K.P.M.), 252, 255 (table), 258, 257, 259 (table), 336, 345, 367
Nederlandsche Nieuw Guinee Petroleum Maatschappij (N.N.G.P.M.), 255 (table), 258
Nederlandsche Oceaan Stoomvaart Maatschappij, 355, 443, 447
Nederlandsche Pacific Petroleum Maatschappij (N.P.P.M.), 255 (table), 256, 257
Nederlandsche Scheepvaarts Unie, 443
Nederlandsch-Indië Aardolie Maatschappij 252, 408
Nederlandsch-Indië Omroepzender Maatschappij, 463
Nederlandsch-Indië Steenkolen Maatschappij (N.I.S.H.M.), 345, 346
Nederlandsch-Indië Vryzinnige Bond (N.I.V.B.), 98
Nederlandsch-Indië Waterkracht Exploitatie Maatschappij, 422
Nederlandsch-Indische Aardolie Maatschappij (N.I.A.M.), 255 (table)
Nederlandsch-Indische Escompto Maatschappij, 332, 333 (table)
Nederlandsch-Indische Handelsbank, 332, 333 (table)
Nederlandsch-Indische Spoorweg (N.I.S.) 354, 415, 416, 417, 418, 419 (table), 426, 429-30
Nederland Stoomvaart Maatschappij, 342, 345, 355, 443, 446, 447, 457
 Negrito, 2, 20
 Negroid type, 2, 3
 Nesiot type, 4
 Netherlands, 77, 82, 85, 106; air services to, 447, 448; steamship services to, 465, 466; trade with, 305, 321
 New Guinea, Dutch, 48, 89, 94, 157, 229 (fig.), 248; oilfields, 258; peoples, 2, 3 (and plate), 5, 27-8; population, 130 (table), 132, 152, 163 (table), 166 (table)
 Nias, 21, 22, 148, 408
 Niboeng palm, 239
 Nickel, 249 (fig.), 336, 471
Nippon Yusen Kaisya, 445
 Noesa (island), *see* under proper name
 Noesanive, Tandjoeng, 375
 Nogulla, 2
 Norddeutscher-Lloyd Line, 447
 Nutmegs, 47, 48, 152; cultivation, 198, 214; export, 172 (table), 301 (table), 395, 397; production, 179 (table)
 Occupation groups, 131 (table)
 Ocean Steamship Company, *see* Blue Funnel Line
 Oebroeg, electric power station, 282 (table)
 Oedjoeng (point), *see* under proper name
 Oedjoeng, Tandjoeng, 362
 Oei Tiong Ham Bank, 333
 Oelelheuë, 341 (table), 369 (and fig.), 370, 439
 Oeliassers, 27, 82
 Oelim, 389
 Oeloe Air, 23
 Oeloeanese, 15
 Oeloe Ngadjoe, 23
 Oembilin coalfield, 252, 265 (and plate), 266, 384, 436, 437
 Oesada, Dr., 96
 Oetan, 20
 Ogan, Air, 377, 379, 407, 435
 Oilfields, 90, 146, 247, 248, 254-8, 391 (plate), 475 (plate), 477, 480; distribution, 253 (fig.); *see* also Petroleum
 Oilseeds, exports of, 301 (table), 358
 Oils, mineral, *see* Petroleum
 Oils, essential, 277, 317; vegetable, 277
 Olo-ot, 24
 Oostervaarwater, 354, 355
 Oosthaven, 341 (table), 381, 382 (fig.), 417, 420, 435
 Oost-Java, province of, 98, 116, 117, 118 (fig.), 120 (plate)
 Oost-Java railway, 419 (table), 432
 Oost-Java tramway, 419 (table)
 Oostkust Residency, 15, 123 (fig.), 156, 163, 319, 405, 455; plantations in, 193 (plate), 197, 198, 199 (plate), 206, 211, 212 (fig.), 213, 285, 289

- Opium, addiction to, 9, 20, 29; factory, 278; revenue from, 327
- Opzieners*, 67
- Orang Aboeng, 18
- Orang Akit, 2, 20
- Orang Doeroet, 16
- Oranges, 208
- Orang Goenoeng, 16
- Orang Laoet, 20
- Orang Mamak, 21
- Orang Pablan, 18
- Orang Sekah, 16
- Orchestra, Javanese, 9 (plate), 10-11
- Osaka Syosyen Kabusiki Kaisya*, 445
- Östasiatiska Kompani*, 448
- Ot-Danoem, 23
- Outer Provinces, administration, 121-4; forest area, 233, 235 (table); labour in, 154-7; roads, 404-12; *see also* under individual islands
- Outrigger canoes, 227-30 (plate)
- Oxen, 205 (table), 206
- Padalarang, 429, paper factory, 279
- Padang, 60, 71, 78, 80, 132, 147, 162, 282, 407, 417, 436, 437, 465, 466; port, 341 (table), 383 (fig.), 384; *see also* Emmahaven
- Padang Highlands, 146, 147, 211, 376, 384
- Padangpandjang, 147, 408, 436, 437, 439
- Padri War, 80, 88
- Painan, treaty of (1663), 60
- Paipahan, 230
- Pajoeng, Poelau, 377
- Pakoe Alam, 84, 454
- Pakpak, 16, 17
- Pakubuwana I, 56, 59
- Pakubuwana II, 57
- Palembang, 40, 44, 61, 74, 80, 88, 146, 154, 156, 161, 162, 282, 407, 408, 417, 465, 466; oilfield, 256 (fig.); port, 260, 265, 340, 341 (table), 376 (plate), 377-9 (fig. and plate); residency of, 16, 123 (fig.), 256
- Pallava characters, 40
- Palm oil, cultivation, 147, 195, 212 (fig.), 213; exports of, 172 (table), 300 (table), 301 (table), 305, 372, 374; production, 179 (table), 193 (plate), 195
- Palm sugar, 192
- Palm wine, 29
- Paloe Taboehan oilfield, 255
- Palopo, 411
- Pamekasan, 145
- Pampelmousse, *see* Pomelo
- Panai, Soengai, 374
- Panaroekan, 341 (table), 361, 362 (fig.), 400
- Panataran, Tjandi, 12
- Panching raweh*, 225
- Pandanus*, 273
- Pandjang, Poelau, 255
- Panghoeloe*, 127
- Pangka, Oedjoeng, 354
- Pangkadjene, 150
- Pangkalanbrandan oilfield, 259 (table), 405; port, 370, 371, 372 (and fig.)
- Pangkalansoesoe, 260, 339, 341 (table), 370, 371, 372 (and fig.), 439, 441
- Pangkalpinang, 148, 408
- Panglongs, timber mills, 286
- Pangrango, Goenoeng, 138
- Pantjendiensten*, 287, 287
- Papaw, 208
- Paper, imports of, 304 (table); manufacture, 279
- Papuans, 2, 3 (and plate), 5, 27
- Paraffin wax, 259 (table); factory, 391
- Pararaton*, 10
- Para rubber, *see* *Hevea brasiliensis*
- Paras, Tandjoeng, 361
- Pareoean type, *see* Mongoloid type
- Pariaman, 147
- Partai Bangsa Indonesia* (P.B.I.), 100
- Partai Indonesia*, 100
- Partai Indonesia Raja* (Parindra), 101
- Partai-Nasional Indonesia* (P.N.I.), 100
- Partai Rajat Indonesia* (P.R.I.), 100
- Partai Sarikat Islam Indonesia* (P.S.I.I.), 100, 101
- Pasé, 46
- Pasemaker, 16
- Pasir, Tandjoeng, 343
- Pasoeroean, 59, 143, 191, 341 (table), 359-60 (fig.), 402
- Pasoeroean railway (419) table, 433
- Pasteur Institute, 453
- Patih, 119, 127
- Patjoel*, 174
- Patoeha, Goenoeng, 241
- Pawnshops, 334
- Payayaran kingdom, 46, 47
- Peanuts, 135, 179 (table), 196, 210, 277
- Pearls, 230
- Pecharan, Tandjoeng, 361

- Pekalongan, 59, 162; port, 339, 341 (table), 351, 352 (fig.); residency of, 118 (fig.)
 Pemali river, 177 (table), 178, 426
 Pematangsiantar, 197, 407, 441
 Penang, 77, 82, 445; tin smelting at, 309
 Peoples, 1-31; *see also under proper names*
 Pepper, 15, 19, 20, 49, 61, 63, 148, 149, 152, 172; cultivation, 198, 213; exports of, 172 (table), 300 (table), 301 (table), 382; production, 179 (table), 198
 Pereng, 41
 Perlak, 46; oilfield, 255
 Perling, Tandjoeng, 371
 Petroleum, 147, 149, 152, 247, 254-60, 264 (plate), 391 (plate), 405, 425, 440, 448, 471, 477, 480; companies, 255 (table), 336; exports of, 247 (table), 248, 258, 259, 299 (table), 300, 301 (table), 306, 347, 358, 378, 390, 392, 468; imports of, 304 (table); production, 248 (fig.), 254 (fig.), 255 (table), 258 (table), 379; refineries, 259 (table), 377 (and plate), 379, 391
 Philip II, 49
 Phosphates, 249 (fig.), 250, 268
 Pigs, 208
 Pinang, *see* Betel nut
 Pineapples, 208
 Piring, Tandjoeng, 354
 Pisang, *see* Bananas
 Pisok, Tandjoeng, 394
 Pladjoe, 146, 264 (plate), 377 (and plate); refinery, 259 (tables), 377 (and plate), 379
 Plantations, 90, 145, 146, 149, 156, 159 (plate), 172, 173, 192-4, 196-7, 199 (plate), 200 (plate), 206, 210, 211, 213, 223, 316, 404; and settlement, 160; cultivated land under, 171 (fig.); development of, 215-7; labour on, 284, 288-93; number of, 179 (table);
 Ploembon, 135
 Ploso, 142 (fig.)
 Poelau (island), *see under proper name*
 Poenan, 2, 23, 24
 Poerwoeredjo railway workshop, 423
 Poerwokerto, 426
 Poetera, 470
 Poeteran island, 363
 Poland, commercial agreement with, 321
 Police system, 128
 Political Economy Bond, 99
 Polygamy, 17, 29
 Pomelo, 208
 Pontianak, 62, 81, 149, 154, 167, 213, 409; port, 341 (table), 385 (plate), 386, 387 (fig.)
 'Popular credit' (*volkescrediet*) movement, 219
 Population, 130-68; and forest area, 234 (fig.); Arab, 168; Chinese, 165-7; distribution and density, 133-52 (figs.); European, 162-5; growth, 152 (table), 153; occupation groups, 131 (table); urban, 131, 146, 149, 453-5; *see also* Peoples
 Porcelain, 68
 Ports, 339-98
 Portugal, 94, 309
 Portuguese, early influence, 46, 47-9, 51 (fig.), 63, 65, 488
 Poso, 25
 Postal Savings Bank, 334
 Posts, telegraphs and telephones, 456-63
 Potatoes, English, 172 (table), 179 (table), 202; sweet, 203
 Pottery, 29, 279, 306 (plate)
 Power, steam, 280; electric, 280-3
 Praboemoelih, 436
 Prambanan, Tjandi, 12
 Praus, trading, 449 (fig.), 450
 Preanger Residency, 12, 13, 54, 55, 56, 67, 118 (fig.), 120 (plate), 197, 206, 210, 231, 241, 250, 268, 273, 453
 Priajibanken, 219
 Priesterraad, 127
 Primary forest, 236; area under, 235 (table)
 Printing trade, 279, 320, 348, 354
 Probolinggo, 143, 341 (table), 360, 402, 361 (fig.)
 Probolinggo railway, 419 (table), 433
 Procureur-General, 125
 Proepoeg, 426
 Progo, Kali, 142, 426, 454
 Provincial council, 116, 117
 Pulses, 179 (table), 181 (fig.), 203
 Pumpkins, 208
 Puppet shows, 11
 Pyrotechnic factories, 348
 Qantas Empire Airways Ltd., 465, 466
 Quinine, 101, 172, 278, 300 (table), 316 (table), 347; *see also* Cinchona

- Quota system, 308, 310, 311, 312, 316, 317, 321, 322, 469
- Raad van Nederlandsch-Indië*, 86, 105, 107; function, 109-10
- Raba, 151
- Radio-telegraphy, 460, 461 (table)
- Radio-telephony, 463
- Raffles, Thomas Stafford, 73-7, 78, 79, 80, 81, 82, 83, 85, 247, 261, 300
- Railways, 347 (plate), 349 (plate), 414-4 (fig. and plate); company, 427 (fig.), 429-33 (and plates), 434 (table), 440 (plates), 441; electric, 348, 416, 419 (table), 420 (and plate), 421; fuel used on, 266, 421, 430, 433, 440, 441 gradients, 427 (fig.), history, 415-8; repair shops, 278, 354, 359, 422 (plates), 423; state, 419 (table), 420-9 (and plates), 434 (table), 435-40 (and plates); traffic, 424-5, 430-41 *passim*; *see also* Steam-tramways
- Rain-forest, *see* Evergreen forest
- Ramayana*, 10, 11, 12, 30
- Rambutan, 208
- Rangda*, witch-widows, 28 (plate), 30
- Rangkasbitong, 402, 420
- Rantau oilfield, 255
- Rantaupadjang coalfield, 265, 266
- Rantauparapat, 374, 441
- Rasamala (*Altingia excelsa*), 238
- Rattans, 239
- Rawar, 20
- Redjang*, Balinese dance, 29 (and plate)
- Redjang Lebonger, 15
- Red rust (*Cephaleuros*), 197
- Refineries, oil, 259 (table), 377 (and plate), 379, 391
- Regeringsreglement*, 78 (1818), 86 (1854)
- Regulation of Industries Ordinance (1934), 320
- Religion, 6, 12, 13, 451-2
- Rembang, oilfields, 425; residency, 118 (fig.), 237, 242, 243, 267, 268
- Rengat, 341 (table), 374, 375 (fig.)
- Residencies, 116, 117, 118 (fig.), 122, 123 (fig.)
- Residency Courts (*Residentiegerecht*), 126
- Resins, 239, 317, 440; exports of, 301 (table), 394
- Revenue, 326 (table), 327, 328 (table)
- Revolutionary Central Union, 294
- Rice, 15, 16, 20, 21, 146, 150-2 *passim*, 172, 209, 211, 213, 214, 425, 432, 471, 486; and population density, 134, 136 (fig.); area under, 179 (table), 182, 185 (fig.); cultivation, 174, 176, 178 (plate), 179 (plates), 182-7; exports of, 172 (table), 188, 301 (table); imports of, 188, 303 (table), 304 (table), 318; in diet, 9, 19, 20, 23, 180-1; mills, 275, 389; production, 187 (table), 188
- Rice-borer (*Scirpophaga innotata*), 186
- Rice bug (*Leptocorisia acuta*), 186
- Riouw archipelago, 20, 62, 81, 93, 211, 264; residency of, 123 (fig.)
- Roads, 399-413 (and plates); surface, 399, 400, 405; traffic, 412-3
- Roeh, Tandjoeng, 379
- Roen, Poelau, trading station, 52
- Rokan, Soengai, 227, 230
- Roman Catholic Party, 98
- Root crops, 179 (table)
- Rosella, 277
- Rotterdamsche-Lloyd Line, 342, 345, 348, 355, 443, 444 (plate), 446, 447, 457
- Roumania, commercial agreement with, 322
- Rubber, 148, 149, 156, 216, 217, 223, 303, 335-7 *passim*, 347, 405, 409, 455, 477, 480, 486; and settlements, 160; cultivation, 192-4 (plate), 211, 212 (fig.), 213, 214; exports of, 172 (table), 173, 299 (table), 300, 301 (table), 302, 305, 306, 313-4; factories, 278, 389; production, 173 179 (table), 313-4
- Sabang, 266, 341 (table), 368-70 (fig. and plates), 444 (plate)
- Sadan, 25
- Sadang, Soengai, 411
- Sago, 22, 27, 28, 203, 214, 480, 481; area under, 235 (table); exports of, 301 (table)
- Sailendra dynasty, 12, 31, 42
- Sakai, 2, 4, 20
- Salajar, 63
- Salak, Goenoeng, 137
- Salt, 145, 247, 248, 249 (fig.), 250, 268-70, 363; production, 270 (table); revenue from, 327
- Samarinda, 163, 409
- Sambas, 62, 81, 149, 409
- Sambodja oilfield, 391, 392

- Sampang, 145
 Sampean river, irrigation works, 177 (table)
 Sampoean, Kali, 361
 Sandakan, 476 (plate), 485, 486, 487
 Sandalwood, 239
 Sand-dunes, and settlement, 160
 Sanga-Sanga oilfield, 389 (fig.), 391 (and plate), 392
Sanghyang, Balinese dance, 29, 30
 Sangkoelirang bay, 257
 Sanjaya, king, 40, 41
 Salatiga, road at, 404 (plate)
 Sanskrit, 10, 30, 40, 41, 42, 452
 Saparoea, 82
 Sapoedi island, 205
 Saragossa, treaty of (1529), 47
 Sarawak, 87, 472, 473 (fig.), 474-8 (and plates)
Sarikat Islam, 96, 99, 100, 101
Sarong, 8, 14, 16, 24
 Sasak, 4, 30
 Satanga, Poelau, 392
 Saving banks, 333-4
Sawah, 176, 177, 180, 182, 190, 196, 201, 203, 209, 211, 213, 214, 240, 241; area under, 175 (fig.)
 Sawahloento, 147, 265, 407, 417, 421, 438
 Sawmills, 279, 348, 354, 379
 Schools, 31-6, 218
 Sea-gypsies, *see* Orang Laoet
 Seaplane anchorages, 349, 354, 359, 370, 373, 379, 380, 381, 384, 386, 387, 391, 392, 395, 397
 'Sea-tin', 261, 262
 Secondary forest, 236-7; area under, 235 (table)
 Seining, 225, 226
 Semampir, Kali, 282 (table), 356
 Semang, 2, 4, 20
 Semarang, 35, 57, 139, 154, 161, 162, 276, 278, 282, 402, 429, 430, 432 (plate), 465, 466; port, 339, 341 (table), 352-4 (figs. and plates); residency of, 118 (fig.), 237, 267
 Semarang-Cheribon steam-tramway, 415, 419 (table), 431 (and plate)
 Semarang-Djoewana steam-tramway, 419 (table), 431, 432 (plate)
 Semawang, 80
 Sembilan, Poelau, 371
 Semendoe, 16
 Seneboli, 230
 Senoi, 2
 Serajoe, Kali, 141, 142, 178 (plate), 367, 426, 429, 432; irrigation works, 178
 Serajoedal steam-tramway, 419 (table), 432
 Serang, *see* Ceram
 Serang river, irrigation works, 177 (table)
 Serangdjaja oilfield, 255
 Serawaier, 15
 Serdang, 87
Sereh grass (*Cymbopogon nardus*), 203
Sero, 226
 Sesajap, Soengai, 150, 391
 Settlements, rural, 137-44 (figs.), 157-60 (plates); urban, *see* Towns and cities
 Shadow-plays, *see* *Wajang Koelit*
 Shamanism, 17
 Shell-fish, 230
 Shipbuilding, 279, 348, 354
 Shifting cultivation, 16, 25, 170, 174, 182, 209, 213, 214, 241
 Shipping, 341 (table), 342, 348, 353, 355, 358, 370, 372, 378, 379, 393, 394, 442-50 (figs. and plates)
 'Short-declaration', 92, 115, 251
 Siak, 61, 62, 87, 88, 93
 Siak, Soengai, 146
 Siam, steamship services to, 445
 Siberoet, 148
 Sibolga, 148, 341 (table), 384, 385 (fig. and plate), 386
 Sibu, 477
 Sigi, 25
 Sigli, 439, 440
 Signalling, railway, 421
 Silk-weaving, 20
 Silver, 250, 252, 267
 Silver Line, 444, 445, 446
 Simau, electric power station, 282
 Simeuloeë, 148
 Simpangkiri river, 408
 Singapore, 82, 83, 87, 245, 260; occupation by Raffles, 78, 81; steamship services to, 445, 446, 447; trade with, 305, 309
 Singaradja, 151
 Singgalang, Goenoeng, 439
 Singhasari kingdom, 42, 43 (fig.), 44
 Singkang, 150
 Singkarak lake, 407, 433 (plate), 436, 437
 Singkawang, 149, 167, 386, 409
 Singkep, tin mines, 262, 264

- Singkep Tin Exploitatie Maatschappij* (S.I.T.E.M.), 262, 264
- Sintang, 149, 386
- Sisal, 199, 212 (fig.), 213, 273 (plate), 277
- Si stji*, 226, 227
- Sitoebendo, 361, 362
- Sivaism, 12, 38, 40, 41, 451
- Slamet, Goenoeng, 141, 404
- Slipways, 346, 350, 351, 357, 367, 369, 370, 372, 378, 384, 390, 393, 397
- Social Democratic Union of the Indies (I.S.D.V.), 98
- Soebak*, 176
- Soebandjeridji, 257
- Soekadana, 62; Dutch factory at, 52
- Soekamandi, sisal factory at, 273 (plate)
- Soekarno, 470
- Soekomo, Dr., 99, 100
- Soemba, 31, 151, 207
- Soembang, Goenoeng, 454
- Soembawa, 4, 31, 65, 151, 207, 412 (fig.)
- Soemberwaroe, 144
- Soembing, Goenoeng, 141
- Soemenep, 145, 362, 363
- Soenda, *see* Payayaran
- Soendanese, 4, 12
- Soendoro, Goenoeng, 141
- Soengai (river), *see under* proper name
- Soengaigerong oil refinery, 259 (table), 377, 379
- Soengaikakap, 386
- Soengaliat, 341 (table), 379 (fig.), 380
- Soerabaja, 35, 44, 120 (plate), 154, 161, 162, 250, 275, 276, 278, 282 (table), 339, 402, 416, 422 (plate), 425, 428, 432; oilfield near, 259 (table); port, 341 (table), 354-9 (figs. and plates); residency of, 118 (fig.), 190, 267
- Soerabaja Droogdok Maatschappij*, 357
- Soerakarta, 141, 161, 162, 198, 210, 402, 420, 426, 429, 430; general description, 455; sultanate, 59, 67, 73, 74, 83, 84, 115-8 *passim*, 134, 141
- Soetomo, Raden, 96, 100
- Soil, 169, 182, 185; and population density, 133, 134, 136, 137, 138, 139 140, 145, 146; erosion, 174-5, 240, 241
- Solo Kali, 141, 402, 428, 455
- Solo*, Javanese dance, 10
- Solok, 147, 407, 438
- Solor islands, 31, 65
- Sour-sop, 208
- South and East Borneo Residency, 123 (fig.)
- South-East Asiatic linguistic family, 5
- South Seas Development Bank, 471
- South Sumatra Agricultural and Industrial Association, 289
- Soya beans, 180, 194, 203, 210; area under, 179 (table); exports of, 172 (table); imports of, 319
- Spaniards, early influence, 49, 50, 52, 63
- Spermonde archipelago, 392
- Spices, 47, 48, 61, 63, 68; cultivation, 198-9; exports of, 301 (table), 394
- Spice Islands, *see* Moluccas
- Sri-vijaya, kingdom of, 40, 41, 42, 43 (fig.), 44
- Staats inrichting van Nederlandsch-Indië*, *see* *Indische Staatsregeling*
- Stake nets, 225
- Standard Oil Company of New York (S.O.C.O.N.Y.), 255 (table), 336
- States-General of the Netherlands, 105, 106, 107, 112
- Steam-tramways, 348, 415, 419 (table), 430-3 (and plates), 441, 454
- Stevenson Restriction Scheme, 194, 313
- Straits Steamship Company, 445, 477, 480, 487
- Strootje*, 9
- Study Clubs, 100
- Stuw* group, 99
- Sugar-cane, 20, 68, 85, 90, 135, 139, 144, 172, 176, 209, 215, 216, 223, 287 303, 337, 404, 425, 432, 454; cultivation, 190 192 (plates), 210; exports of 172 (table), 188, 299 (table), 300, 301 (table), 305, 309-11, 359, 360, 362, 367; factories, 190, 191, 192 (plate), 274, 280 (table), 311, 351, 359, 415, 431, 432; production, 179 (table), 188, 190-2, 309-11; stocks of, 310 (fig.)
- Sugar Export Ordinance (1931), 310
- Sugar Law, (1870), 86
- Sulphur, 249 (fig.), 250, 268
- Sulphuric acid manufacture, 278, 391
- Sulphurous acid manufacture, 391
- Sumatra, administration, 115, 116, 117 (table), 122, 123 (fig.), 124; agriculture, 179 (plate), 193 (plate), 199 (plate), 210-13; fisheries, 224-32; forests, 233, 235 (table), 236, 238, 245; history, 38-53 *passim*, 59, 60 (fig.), 61-2, 80-1, 83, 87, 88, 91-3; indus-

- tries, 271, 273 (plate), 275, 276 (table), 278, 279, 281 (table); labour in, 285, 286, 288-93; land tenure, 224-32; livestock, 205-8 *passim*; mining, 247-70 *passim* (and plates); oilfields, 254-9 *passim*; peoples, 2 (plate), 3, 4, 13-22 (and plates); population, 130 (table), 132, 145-8, 163 (table), 166 (table); ports, 340 (fig.), 341 (table), 367-86 (and plates); railways, 414 (table), 433-41 (figs. and plates); roads, 404-8 *passim* (and plates); towns, 454 (plate), 455
- Sumatra's Westkust Staat Spoorweg* (S.S.S.), 433 (plates), 436, 437, 438 (fig.), 439
- Sumatran pine, 238
- Sumatras*, 342
- Swamp forest, 236
- Swine, *see* Pigs
- Tabanio, 63
- Takalar, 150, 394
- Talang, 20
- Talang Akar-Pendopps oilfield, 257
- Talangbetoetoe, 379
- Talang Djimar oilfield, 257
- Taman Siswa (Children's Garden), 100
- Tambak*, 231
- Tambang Sawah, 252
- Tanah, Tandjoeng, 349, 350
- Tanakeke strait, 392
- Tandjoeng (cape), *see under* proper name
- Tandjoengbalai, 147, 339, 341 (table), 373 (fig.), 374, 376 (plate), 441
- Tandjoengpandan, 148, 341 (table), 380, 381 (fig.), 384 (plate), 408
- Tandjoengperak, *see* Soerabaja
- Tandjoengpinang, 148
- Tandjoengpriok, 154, 278, 279, 339, 341 (table), 343-9 (and plates); *see also* Batavia
- Tandjoengpriok Droogdok Maatschappij*, 346
- Tandjoengseilor, 149
- Tangerang, 273
- Tanggoel river, irrigation works, 177 (table)
- Tangkoebanprahoe, Goenoeng, 137 (fig.), 138, 139
- Tanimbar islands, 26, 27, 65
- Tanker fleet, 448
- Tanning, 279
- Tapanoeli, 53, 61, 77, 88; residency of, 21, 123 (fig.), 211, 385
- Tapioca, *see* Cassava
- Tapiro, 2
- Tarakan, Poelau, oilfield, 257, 258 (table), 259 (table)
- Tarakan, 150, 391, 392, 460
- Taro, 22
- Tasikmalaja, 429
- Tattooing, 23
- Taxation, 327, 328 (table); incidence, 331
- Tea, 68, 147, 159 (plate), 209, 217, 241, 335; cultivation, 197, 210 (fig.), 212 (fig.), 213; exports of, 172 (table), 299 (table), 300, 301 (table), 306, 311-3, 347, 372; production, 179 (table), 311-3
- Teak forest, 236, 237 (fig.), 242, 243, 245 (fig.), 432; area under, 235 (table), 238 (fig.); economic value, 237, 238
- Tebingtinggi, 147, 407, 441
- Tegal, 59, 67, 276, 277, 339, 402, 404, 431 (and plate); port, 341 (table), 350 (fig.), 351
- Tegallan, 175, 241
- Telaga Said oilfield, 255
- Teloekbagoes, 374
- Teloekbetoeng, 341 (table), 381, 382 (fig.)
- Temperoeng-Besar, Poelau, 387
- Tenggerese, 4, 13
- Ternate, 5, 46-52 *passim*, 63, 65, 66, 71, 152
- Textiles, 135, 139, 276-7; imports of, 303 (table), 304 (table), 306, 353, 394
- Tides, 342, 344, 355, 365, 368, 372, 377, 393
- Tidore, 5, 46, 47, 48, 52, 65, 152
- Tikoe, 52
- Timber, 233-46 *passim*, 279, 425, 440, 486; exports of, 301 (table); imports of, 304 (table); production, 245 (fig.)
- Time, note on, 464
- Timor, Dutch, 2, 48, 65, 74, 82, 151, 239; mining, 248, 250; peoples, 31; residency of, 123 (fig.); roads, 412 (fig.)
- Timor, Portuguese, 488-9
- Tin, 61, 88, 90, 148, 167, 247, 248, 260-4, 336; exports of, 247 (table), 299 (table), 300, 301 (table), 305, 306, 380, 381; mining, 249 (fig.), 262-3,

- 264 (plate); occurrence, 260-1; production, 263 (fig.), 264, 308-9; regulation of output, 308-9; smelting, 263
- Tin Producers' Association, 308
- Tjamba Pass, road over, 405 (plate)
- Tjandi, 353
- Tjarat, Tandjoeng, 377
- Tjareme, Goënoeng, 138
- Tjepoe oilfield, 259 (table), 431
- Tjeroetjoep, Soengai, 380
- Tjibahoeng, 136
- Tjibesoro, railway viaduct over, 431 (plate)
- Tjibodas mountain garden, 218
- Tjikampek, 420, 426
- Tjilatjap, 341 (table), 365-7 (fig.), 420
- Tjiliwoeng, 135, 346, 348, 425, 428, 453; railway bridge over, 423 (plate)
- Tjimahi, 138
- Tjimanoeck, 190, 426; irrigation works, 177 (table)
- Tjinkoe, 60
- Tjioedjoeng, irrigation works, 177 (table)
- Tjitandoej, 402
- Tjitaroem, 158 (fig.), 159, 426, 429, 453; irrigation works, 177 (table)
- Tjiwidej, experimental forest at, 241
- Toäla, 2, 26
- Tobacco, 15, 16, 135, 145, 147, 151, 216, 288, 336, 454, 455, 485, 486; cultivation, 198, 199 (plate), 212 (fig.); exports of, 172 (table), 299 (table), 300, 301 (table); imports of, 304 (table), 306; production, 179 (table)
- Toba lake (Toba-meer), 16, 17, 148, 407, 455
- Toeban, 44
- Toekoe Oema, 91, 92
- Toentang river, irrigation works, 177 (table)
- Toesam, 238
- Tondano lake, 395
- Toradja, 4, 19 (plate), 25
- Tordesillas, treaty of, (1494), 47
- Tortoise-shell manufacture, 454
- Totemism, 26, 27, 31
- Towers, fishing, 226
- Towoeti lake, 411
- Towns and cities, 160-2, 453-5
- Trade, foreign, 304-6, 340 (fig.), 347, 350-94 *passim*; regulation of, 306-22; value of, 297, 298 (table))
- Trade unions, 294-5
- Tramways, 359, 431, 432, 433
- Transport, numbers employed in, 131 (table)
- Traps, fish, 225, 226
- Trass, 250
- Trassi, 230, 231
- Treaties, *see under* proper name
- Trepang, 230
- Triton bay, 89
- Turkey, commercial agreement with, 322
- Turtles, 230
- United States, 101, 102; steamship services to, 446, 447; trade with, 305, 309
- United States Rubber Company, 337
- Urban Communities (*Stadsgemeenten*), 122
- Urban population, *see* Population, Towns and cities
- Van Heutsz, Governor-General, 92, 94, 251, 417
- Vaterlandsche Club, 99
- Vegetables, 180 (fig.), 181 (fig.), 208; in diet, 19, 20, 22
- Vergaderingen, 121, 122
- Veterinary Service, 207
- Victoria (Labuan), 481
- Village government, 7, 8, 14, 17, 76, 119-21, 124, 128
- Village Ordinance for Outer Provinces (1939), 124
- Village Regulation (1906), 7, 97
- Vishnu, 38
- Vogelkop oilfields, 258
- Volcanoes, and settlement, 137 (fig.), 138-51 *passim*, 159 (fig.), 160
- Volksraad, 98, 99, 107, 108, 109 (and plate), 114, 290; formation of, 97, 101, 110; membership, 111; powers, 105, 110-3
- Vorstenlanden (Native States), 197, 221 (table), 222, 415, 429; *see also* Jogjakarta, Soerakarta
- Wadoek, 176
- Wages, 285, 286
- Wai (river), *see under* proper name
- Wajang Golek, 11
- Wajang Koelit, 10, 11
- Wajang Wong, 11, 30

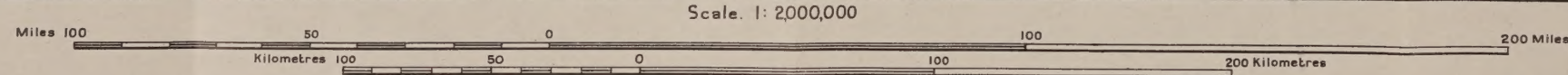
- Wallace, A. R., 11
 Warehouses, 345, 353, 356, 367, 370, 372, 382, 384, 385, 393, 397
 War of 1914-18, 99, 156, 194, 265, 271, 273, 303, 327, 416
 Wasian oilfield, 258
 Watoedakon, 178
 We, Poelau, 368, 369
 Welirang, Goenoeng, 268
 Weltevreden, 278, 347, 349 (plates), 425, founding of, 72; *see also* Batavia
 West-Borneo, Residency, 123 (fig.)
 Westervaarwater, 354, 355
 West-Java, province of, 98, 116, 117, 118 (fig.), 347
 Westkust Residency, 21, 123 (fig.), 211
 Wetar island, 2, 31
 White grub (*Holotrichi helleri*), 186
 Wildhoutbosschen, 236, 243, 244
 Willem I, 430
 William I, king of the Netherlands, 78
 William V, Stadtholder, 71
 Wireless stations, 460, 461 (table), 463
 Wolfram, 261
 Wonokromo, 359 (plate), 428, 432; canal, 359; refinery, 259 (table)
 Wonosobo, 432
 Wood, carving, 15, 20, 29; working, 279
 Xavier, St. Francis, 48
 Yams, 22; area under, 179 (table)
 Yoghurt, 275
 Yokohama Specie Bank, 333, 471
Zeekrijgraden bij den Landmacht, 128
Zuid-Sumatra Staat Spoorweg (Z.S.S.), 434 (table), 435-6

JAVA AND MADURA

FOURTH EDITION



Geographical Section, General Staff, N° 1981
Published by War Office 1919.
Fourth Edition 1941.
1/43/6222.

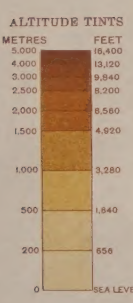


REFERENCE

Railways..... Other Roads.....
Tramways..... Footpaths.....
Principal Roads..... Boundaries of Provinces.....+++++

Boundaries of Residencies.....++++
Capital of Residency.....●
Capital of Regency.....○
Other Towns.....●

Drawn and Photolithographed by the War Office, 1941.



Atlas van Tropisch Nederland.
Sarawak 1:1,267,200,
Sarawak 1:500,000,
Brunei 1:250,000,
British North Borneo 1:500,000,
Provincia de Timor 1:1,000,000,
Malaya 1:380,160,
Admiralty Charts.

